

APPENDIX C

ADDITIONAL AREA SOURCE DATA

- Area Source Category Forms

SOURCE TYPE: Area

SOURCE CATEGORY: Industrial Fuel Combustion – Distillate

DESCRIPTION:

Industrial consumption of distillate fuel. Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National level distillate fuel usage in the industrial sector (ERG, 2003d; PEMEX, 2003a; SENER, 2000a; SENER, 2001a; SENER, 2002a)
- National and state level employee statistics for the industrial sector (CMAP 20-39) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 2.88 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- SO_x – 0.716 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- VOC – 0.024 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- CO – 0.6 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- PM – 0.24 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])

NOTES AND ASSUMPTIONS:

- Specific fuel type is industrial diesel (PEMEX, 2003a; ERG, 2003d).
- Bulk terminal-weighted average sulfur content of distillate fuel was calculated to be 0.038% (PEMEX, 2003d).
- Particle size fraction for PM₁₀ is assumed to be 50% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Particle size fraction for PM_{2.5} is assumed to be 12% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Industrial area source distillate quantities were reconciled with the industrial point source inventory by subtracting point source inventory distillate quantities from the area source distillate quantities.

SAMPLE CALCULATIONS:

Estimate annual emissions from distillate fuel oil combustion in the industrial sector in Baja California.

Industrial area source distillate usage in Baja California = 86,553,182 liters/year

Point source inventory distillate usage in Baja California = 14,902,246 liters/year

Reconciled industrial area source distillate usage = 86,553,182 – 14,902,246 = 71,650,936 liters/year

State level emissions:

Annual NO_x emissions = 2.88 kg/1,000 liters × (71,650,936 liters) = 206,355 kg = 206.4 Mg

Annual SO_x emissions = 0.716 kg/1,000 liters × (71,650,936 liters) = 51,302 kg = 51.3 Mg

Annual VOC emissions = 0.024 kg/1,000 liters × (71,650,936 liters) = 1,720 kg = 1.7 Mg

Annual CO emissions = 0.6 kg/1,000 liters × (71,650,936 liters) = 42,991 kg = 43.0 Mg

Annual PM₁₀ emissions = 0.50 × 0.24 kg/1,000 liters × (71,650,936 liters) = 8,598 kg = 8.6 Mg

Annual PM_{2.5} emissions = 0.12 × 0.24 kg/1,000 liters × (71,650,936 liters) = 2,064 kg = 2.1 Mg

Municipality level emissions – Mexicali:

Baja California employees in the industrial sector = 249,176

Mexicali employees in the industrial sector = 61,822

Annual NO_x emissions = 206.4 Mg × (61,822/249,176) = 51.2 Mg

Industrial Fuel Combustion – Distillate							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes ^a	33.6	8.4	0.3	7.0	1.4	0.3
02	Baja California ^a	206.4	51.3	1.7	43.0	8.6	2.1
03	Baja California Sur ^b	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche ^a	17.1	4.3	0.1	3.6	0.7	0.2
05	Coahuila ^a	170.5	42.4	1.4	35.5	7.1	1.7
06	Colima ^a	9.6	2.4	0.1	2.0	0.4	0.1
07	Chiapas ^b	0.0	0.0	0.0	0.0	0.0	0.0
08	Chihuahua ^a	356.8	88.7	3.0	74.3	14.9	3.6
09	Distrito Federal ^a	283.4	70.5	2.4	59.0	11.8	2.8
10	Durango ^a	57.9	14.4	0.5	12.1	2.4	0.6
11	Guanajuato ^a	224.4	55.8	1.9	46.7	9.3	2.2
12	Guerrero ^b	0.0	0.0	0.0	0.0	0.0	0.0
13	Hidalgo ^a	62.7	15.6	0.5	13.1	2.6	0.6
14	Jalisco ^a	15.6	3.9	0.1	3.3	0.7	0.2
15	México ^b	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán ^a	52.5	13.1	0.4	10.9	2.2	0.5
17	Morelos ^a	8.3	2.1	0.1	1.7	0.3	0.1
18	Nayarit ^b	0.0	0.0	0.0	0.0	0.0	0.0
19	Nuevo León ^a	317.7	79.0	2.6	66.2	13.2	3.2
20	Oaxaca ^a	37.4	9.3	0.3	7.8	1.6	0.4
21	Puebla ^a	176.3	43.8	1.5	36.7	7.3	1.8
22	Querétaro ^a	67.7	16.8	0.6	14.1	2.8	0.7
23	Quintana Roo	9.6	2.4	0.1	2.0	0.4	0.1
24	San Luis Potosí ^a	51.7	12.9	0.4	10.8	2.2	0.5
25	Sinaloa ^a	36.6	9.1	0.3	7.6	1.5	0.4
26	Sonora ^a	22.7	5.6	0.2	4.7	0.9	0.2
27	Tabasco ^a	23.3	5.8	0.2	4.8	1.0	0.2
28	Tamaulipas ^a	195.6	48.6	1.6	40.8	8.2	2.0
29	Tlaxcala ^a	46.0	11.4	0.4	9.6	1.9	0.5
30	Veracruz ^b	0.0	0.0	0.0	0.0	0.0	0.0
31	Yucatán ^a	56.2	14.0	0.5	11.7	2.3	0.6
32	Zacatecas ^a	22.6	5.6	0.2	4.7	0.9	0.2
National		2,562.2	637.2	21.4	533.7	106.8	25.8

^a States where area source fuel quantities were reconciled with point source fuel usage.

^b States where point source fuel usage exceeded area source fuel quantities; emissions zeroed out as part of point source fuel reconciliation.

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Commercial Fuel Combustion – Distillate

DESCRIPTION:

Commercial consumption of distillate fuel (includes diesel). Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National level distillate fuel usage in the commercial sector (ERG, 2003d; PEMEX, 2003a; SENER, 2000a; SENER, 2001a; SENER, 2002a)
- National and municipality level employee statistics for the commercial sector (CMAP 50-97) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 2.4 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- SO_x – 0.6312 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- VOC – 0.0408 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- CO – 0.6 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- PM – 0.24 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])

NOTES AND ASSUMPTIONS:

- Specific fuel type is diesel (PEMEX, 2003a; ERG, 2003d).
- Bulk terminal-weighted average sulfur content of distillate fuel was calculated to be 0.037% (PEMEX, 2003d).
- Particle size fraction for PM₁₀ is assumed to be 55% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Particle size fraction for PM_{2.5} is assumed to be 42% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).

SAMPLE CALCULATIONS:

Estimate annual emissions from distillate fuel oil combustion in the commercial sector in Baja California.

National level emissions:

National level distillate fuel quantity used by the commercial sector = 98,013,286 liters/year

Annual NO_x emissions = 2.4 kg/1,000 liters × (98,013,286 liters) = 235,232 kg = 235.2 Mg

Annual SO_x emissions = 0.6312 kg/1,000 liters × (98,013,286 liters) = 61,866 kg = 61.9 Mg

Annual VOC emissions = 0.0408 kg/1,000 liters × (98,013,286 liters) = 3,999 kg = 4.0 Mg

Annual CO emissions = 0.6 kg/1,000 liters × (98,013,286 liters) = 58,808 kg = 58.8 Mg

Annual PM₁₀ emissions = 0.55 × 0.24 kg/1,000 liters × (98,013,286 liters) = 12,938 kg = 12.9 Mg

Annual PM_{2.5} emissions = 0.42 × 0.24 kg/1,000 liters × (98,013,286 liters) = 9,880 kg = 9.9 Mg

State level emissions:

National commercial sector employees = 9,173,249

Baja California commercial sector employees = 258,796

Annual NO_x emissions = 235.2 Mg × (258,796/9,173,249) = 6.6 Mg

Municipality level emissions – Mexicali:

Mexicali commercial sector employees = 70,826

Annual NO_x emissions = 6.6 Mg × (70,826/258,796) = 1.8 Mg

Commercial Fuel Combustion – Distillate							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	2.6	0.7	0.0	0.7	0.1	0.1
02	Baja California	6.7	1.7	0.1	1.7	0.4	0.3
03	Baja California Sur	1.6	0.4	0.0	0.4	0.1	0.1
04	Campeche	1.6	0.4	0.0	0.4	0.1	0.1
05	Coahuila	6.7	1.8	0.1	1.7	0.4	0.3
06	Colima	1.5	0.4	0.0	0.4	0.1	0.1
07	Chiapas	5.0	1.3	0.1	1.2	0.3	0.2
08	Chihuahua	7.8	2.0	0.1	1.9	0.4	0.3
09	Distrito Federal	48.6	12.8	0.8	12.2	2.7	2.0
10	Durango	2.9	0.8	0.0	0.7	0.2	0.1
11	Guanajuato	9.6	2.5	0.2	2.4	0.5	0.4
12	Guerrero	5.2	1.4	0.1	1.3	0.3	0.2
13	Hidalgo	3.2	0.8	0.1	0.8	0.2	0.1
14	Jalisco	17.4	4.6	0.3	4.4	1.0	0.7
15	México	21.2	5.6	0.4	5.3	1.2	0.9
16	Michoacán	7.3	1.9	0.1	1.8	0.4	0.3
17	Morelos	3.6	1.0	0.1	0.9	0.2	0.2
18	Nayarit	1.9	0.5	0.0	0.5	0.1	0.1
19	Nuevo León	13.5	3.6	0.2	3.4	0.7	0.6
20	Oaxaca	4.9	1.3	0.1	1.2	0.3	0.2
21	Puebla	9.0	2.4	0.2	2.3	0.5	0.4
22	Querétaro	3.2	0.8	0.1	0.8	0.2	0.1
23	Quintana Roo	3.2	0.8	0.1	0.8	0.2	0.1
24	San Luis Potosí	4.4	1.1	0.1	1.1	0.2	0.2
25	Sinaloa	6.1	1.6	0.1	1.5	0.3	0.3
26	Sonora	5.9	1.6	0.1	1.5	0.3	0.2
27	Tabasco	3.3	0.9	0.1	0.8	0.2	0.1
28	Tamaulipas	7.5	2.0	0.1	1.9	0.4	0.3
29	Tlaxcala	1.6	0.4	0.0	0.4	0.1	0.1
30	Veracruz	11.7	3.1	0.2	2.9	0.6	0.5
31	Yucatán	4.3	1.1	0.1	1.1	0.2	0.2
32	Zacatecas	2.2	0.6	0.0	0.5	0.1	0.1
National		235.2	61.9	4.0	58.9	13.0	9.9

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Industrial Fuel Combustion – Residual

DESCRIPTION:

Industrial consumption of residual fuel. Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National level residual fuel usage in the industrial sector (ERG, 2003d; PEMEX, 2003a; SENER, 2000a; SENER, 2001a; SENER, 2002a)
- National and municipality level employee statistics for the industrial sector (CMAP 20-39) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 5.64 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- SO_x – 69.685 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- VOC – 0.0336 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- CO – 0.6 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- PM – 4.465 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])

NOTES AND ASSUMPTIONS:

- Specific fuel types include combustoleo, Intermedio 15, and Industrial Combustible (PEMEX, 2003a; ERG, 2003d).
- Bulk terminal-weighted average sulfur content of residual fuel was estimated to be 3.699% (combustoleo, Intermedio 15, and Industrial Combustible) (PEMEX, 2003d).
- Particle size fraction for PM₁₀ is assumed to be 86% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Particle size fraction for PM_{2.5} is assumed to be 56% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Industrial area source residual quantities were reconciled with the industrial point source inventory by subtracting point source inventory residual quantities from the area source residual quantities.
- Residual quantities from the point source inventory exceeded allocated industrial area source residual quantities for Sonora and Tamaulipas; area source residual quantities for these states were set to zero.
- Sale of residual fuel is banned in Federal District; therefore, there are no residual fuel combustion emissions in the Federal District.

SAMPLE CALCULATIONS:

Estimate annual emissions from residual fuel oil combustion in the industrial sector in Baja California.

Industrial area source residual usage in Baja California = 299,936,779 liters/year

Point source inventory residual usage in Baja California = 88,228,761 liters/year

Reconciled industrial area source residual usage = 299,936,779 – 88,228,761 = 211,708,018 liters/year

State level emissions:

Annual NO_x emissions = 5.64 kg/1,000 liters × (211,708,018 liters) = 1,194,033 kg = 1,194.3 Mg

Annual SO_x emissions = 69.685 kg/1,000 liters × (211,708,018 liters) = 14,752,873 kg = 14,752.9 Mg

Annual VOC emissions = 0.0336 kg/1,000 liters × (211,708,018 liters) = 7,113 kg = 7.1 Mg

Annual CO emissions = 0.6 kg/1,000 liters × (211,708,018 liters) = 127,024 kg = 127.0 Mg

Annual PM₁₀ emissions = 0.86 × 4.465 kg/1,000 liters × (211,708,018 liters) = 812,937 kg = 812.9 Mg

Annual PM_{2.5} emissions = 0.56 × 4.465 kg/1,000 liters × (211,708,018 liters) = 529,354 kg = 529.4 Mg

Municipality level emissions – Mexicali:

Baja California industrial sector employees = 249,176

Mexicali industrial sector employees = 61,822

Annual NO_x emissions = 1,194.3 Mg × (61,822/249,176) = 296.3 Mg

Industrial Fuel Combustion – Residual							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes ^a	354.8	4,384.2	2.1	37.7	241.6	157.3
02	Baja California ^a	1,194.0	14,752.8	7.1	127.0	813.0	529.4
03	Baja California Sur ^a	81.3	1,004.8	0.5	8.7	55.4	36.1
04	Campeche ^b	0.0	0.0	0.0	0.0	0.0	0.0
05	Coahuila ^a	549.6	6,790.7	3.3	58.5	374.2	243.7
06	Colima ^b	0.0	0.0	0.0	0.0	0.0	0.0
07	Chiapas ^a	55.4	685.0	0.3	5.9	37.7	24.6
08	Chihuahua ^a	1,821.8	22,508.9	10.9	193.8	1,240.4	807.7
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango ^a	92.2	1,139.6	0.5	9.8	62.8	40.9
11	Guanajuato ^a	1,491.5	18,428.5	8.9	158.7	1,015.6	661.3
12	Guerrero ^a	119.3	1,474.1	0.7	12.7	81.2	52.9
13	Hidalgo ^b	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco ^a	1,070.5	13,226.8	6.4	113.9	728.9	474.6
15	México ^a	1,977.9	24,437.7	11.8	210.4	1,346.7	876.9
16	Michoacán ^b	0.0	0.0	0.0	0.0	0.0	0.0
17	Morelos ^b	0.0	0.0	0.0	0.0	0.0	0.0
18	Nayarit ^a	59.5	735.0	0.4	6.3	40.5	26.4
19	Nuevo León ^a	932.5	11,521.7	5.6	99.2	634.9	413.5
20	Oaxaca ^b	0.0	0.0	0.0	0.0	0.0	0.0
21	Puebla ^b	0.0	0.0	0.0	0.0	0.0	0.0
22	Querétaro ^a	349.4	4,317.3	2.1	37.2	237.9	154.9
23	Quintana Roo	65.3	807.3	0.4	7.0	44.5	29.0
24	San Luis Potosí ^b	0.0	0.0	0.0	0.0	0.0	0.0
25	Sinaloa ^b	0.0	0.0	0.0	0.0	0.0	0.0
26	Sonora ^b	0.0	0.0	0.0	0.0	0.0	0.0
27	Tabasco ^a	149.1	1,842.7	0.9	15.9	101.5	66.1
28	Tamaulipas ^b	0.0	0.0	0.0	0.0	0.0	0.0
29	Tlaxcala ^a	157.9	1,950.8	0.9	16.8	107.5	70.0
30	Veracruz ^b	0.0	0.0	0.0	0.0	0.0	0.0
31	Yucatán ^b	0.0	0.0	0.0	0.0	0.0	0.0
32	Zacatecas	199.0	2,458.4	1.2	21.2	135.5	88.2
National		10,721.3	132,466.1	63.9	1,140.6	7,300.1	4,753.5

^a States where area source fuel quantities were reconciled with point source fuel usage.

^b States where point source fuel usage exceeded area source fuel quantities; emissions zeroed out as part of point source fuel reconciliation.

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Commercial Fuel Combustion – Residual

DESCRIPTION:

Commercial consumption of residual fuel. Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National level residual fuel usage in the commercial sector (ERG, 2003d; PEMEX, 2003a; SENER, 2000a; SENER, 2001a; SENER, 2002a)
- National and state level employee statistics for the commercial sector (CMAP, 50-97) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 6.6 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- SO_x – 70.843 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- VOC – 0.1356 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- CO – 0.6 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- PM – 1.2 kg/1,000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])

NOTES AND ASSUMPTIONS:

- Specific fuel type is combustoleo. (PEMEX, 2003a; ERG, 2003d)
- Bulk terminal-weighted average sulfur content of residual fuel was calculated to be 3.760% (combustoleo only) (PEMEX, 2003d).
- Particle size fraction for PM₁₀ is assumed to be 62% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Particle size fraction for PM_{2.5} is assumed to be 23% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Sale of residual fuel is banned in Federal District; therefore, there are no residual fuel combustion emissions in the Federal District.

SAMPLE CALCULATIONS:

Estimate annual emissions from residual fuel oil combustion in the commercial sector in Baja California.

National level emissions:

National level residual fuel quantity used by the commercial sector = 792,926,901 liters/year

Annual NO_x emissions = 6.6 kg/1,000 liters × (792,926,901 liters) = 5,233,318 kg = 5,233.3 Mg

Annual SO_x emissions = 70.843 kg/1,000 liters × (792,926,901 liters) = 56,173,245 kg = 56,173.2 Mg

Annual VOC emissions = 0.1356 kg/1,000 liters × (792,926,901 liters) = 107,521 kg = 107.5 Mg

Annual CO emissions = 0.6 kg/1,000 liters × (792,926,901 liters) = 475,756 kg = 475.8 Mg

Annual PM₁₀ emissions = 0.62 × 1.2 kg/1,000 liters × (792,926,901 liters) = 589,938 kg = 589.9 Mg

Annual PM_{2.5} emissions = 0.23 × 1.2 kg/1,000 liters × (792,926,901 liters) = 218,848 kg = 218.8 Mg

State level emissions:

National commercial sector employees = 7,276,354

Baja California commercial sector employees = 258,796

Annual NO_x emissions = 5,233.3 Mg × (258,796/7,276,354) = 186.1 Mg

Municipality level emissions – Mexicali:

Mexicali commercial sector employees = 70,826

Annual NO_x emissions = 186.1 Mg × (70,826/258,796) = 50.9 Mg

Commercial Fuel Combustion – Residual							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	74.1	795.4	1.5	6.7	8.4	3.1
02	Baja California	186.1	1,997.9	3.8	16.9	21.0	7.8
03	Baja California Sur	44.9	481.7	0.9	4.1	5.1	1.9
04	Campeche	44.2	474.6	0.9	4.0	5.0	1.8
05	Coahuila	187.4	2,011.7	3.9	17.0	21.1	7.8
06	Colima	42.7	458.6	0.9	3.9	4.8	1.8
07	Chiapas	139.8	1,500.9	2.9	12.7	15.8	5.8
08	Chihuahua	218.2	2,341.7	4.5	19.8	24.6	9.1
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	81.4	874.1	1.7	7.4	9.2	3.4
11	Guanajuato	270.6	2,905.1	5.6	24.6	30.5	11.3
12	Guerrero	147.0	1,578.1	3.0	13.4	16.6	6.1
13	Hidalgo	90.5	971.9	1.9	8.2	10.2	3.8
14	Jalisco	488.3	5,241.3	10.0	44.4	55.0	20.4
15	México	593.5	6,370.8	12.2	54.0	66.9	24.8
16	Michoacán	206.1	2,212.4	4.2	18.7	23.2	8.6
17	Morelos	102.3	1,098.3	2.1	9.3	11.5	4.3
18	Nayarit	52.2	559.8	1.1	4.7	5.9	2.2
19	Nuevo León	378.6	4,064.3	7.8	34.4	42.7	15.8
20	Oaxaca	137.3	1,473.6	2.8	12.5	15.5	5.7
21	Puebla	252.6	2,711.8	5.2	23.0	28.5	10.6
22	Querétaro	89.2	957.9	1.8	8.1	10.1	3.7
23	Quintana Roo	89.4	959.3	1.8	8.1	10.1	3.7
24	San Luis Potosí	122.1	1,311.1	2.5	11.1	13.8	5.1
25	Sinaloa	172.5	1,851.2	3.5	15.7	19.4	7.2
26	Sonora	166.8	1,790.9	3.4	15.2	18.8	7.0
27	Tabasco	91.6	982.9	1.9	8.3	10.3	3.8
28	Tamaulipas	209.8	2,252.2	4.3	19.1	23.7	8.8
29	Tlaxcala	44.9	481.5	0.9	4.1	5.1	1.9
30	Veracruz	327.6	3,516.7	6.7	29.8	36.9	13.7
31	Yucatán	120.8	1,297.1	2.5	11.0	13.6	5.1
32	Zacatecas	60.4	648.5	1.2	5.5	6.8	2.5
National		5,233.3	56,173.2	107.5	475.8	589.9	218.8
							0.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Industrial Fuel Combustion – LPG

DESCRIPTION:

Industrial combustion of liquefied petroleum gas (LPG). Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- State level LPG usage by sector (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000b; SENER, 2001b; SENER, 2002b)
- Municipality level employee statistics for the industrial sector (CMAP 20-39) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 2.424 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- SO_x – 0.00464 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- VOC – 0.0432 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- CO – 0.413 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- PM – 0.072 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])

NOTES AND ASSUMPTIONS:

- LPG is assumed to contain 60% propane and 40% butane.
- Sulfur content of propane and butane is assumed to be 0.4114 gr/100 ft³.
- Emission factor for total PM is assumed to represent PM₁₀ and PM_{2.5} emissions.
- Industrial area source LPG quantities were reconciled with the industrial point source inventory by subtracting point source inventory LPG quantities from the area source LPG quantities.

SAMPLE CALCULATIONS:

Estimate annual emissions from industrial LPG usage in Chihuahua.

Industrial area source LPG usage in Chihuahua = 37,419 m³/year = 37,419,000 liters/year

Point source inventory LPG usage in Chihuahua = 14,334 m³/year = 14,334,000 liters/year

Reconciled industrial area source LPG usage = 37,419,000 liters/year – 14,334,000 liters/year = 23,085,000 liters/year

State level emissions:

Annual NO_x emissions = 2.424 kg/1,000 liters × (23,085,000 liters) = 55,958 kg = 56.0 Mg

Annual SO_x emissions = 0.00464 kg/1,000 liters × (23,085,000 liters) = 107 kg = 0.1 Mg

Annual VOC emissions = 0.0432 kg/1,000 liters × (23,085,000 liters) = 997 kg = 1.0 Mg

Annual CO emissions = 0.413 kg/1,000 liters × (23,085,000 liters) = 9,529 kg = 9.5 Mg

Annual PM₁₀ emissions = 0.072 kg/1,000 liters × (23,085,000 liters) = 1,661 kg = 1.7 Mg

Annual PM_{2.5} emissions = 1.7 Mg

Municipality level emissions – Ciudad Juárez:

Number of employees in Chihuahua in the industrial sector = 358,243

Number of employees in Ciudad Juárez in the industrial sector = 240,958

Ratio of municipality level employees to state level employees in the industrial sector = 240,958/358,243 = 0.6726

Annual NO_x emissions = 56.0 Mg × 0.6726 = 37.6 Mg

Annual SO_x emissions = 0.1 Mg × 0.6726 = 0.1 Mg

Annual VOC emissions = 1.0 Mg × 0.6726 = 0.7 Mg

Annual CO emissions = 9.5 Mg × 0.6726 = 6.4 Mg

Annual PM₁₀ emissions = 1.7 Mg × 0.6726 = 1.1 Mg

Annual PM_{2.5} emissions = 1.1 Mg

Industrial Fuel Combustion – LPG							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes ^b	0.0	0.0	0.0	0.0	0.0	0.0
02	Baja California ^b	0.0	0.0	0.0	0.0	0.0	0.0
03	Baja California Sur ^a	8.1	0.0	0.1	1.4	0.2	0.2
04	Campeche	5.8	0.0	0.1	1.0	0.2	0.2
05	Coahuila ^b	0.0	0.0	0.0	0.0	0.0	0.0
06	Colima	10.4	0.0	0.2	1.8	0.3	0.3
07	Chiapas ^a	42.9	0.1	0.8	7.3	1.3	1.3
08	Chihuahua ^a	56.0	0.1	1.0	9.5	1.7	1.7
09	Distrito Federal ^b	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango ^a	20.4	0.0	0.4	3.5	0.6	0.6
11	Guanajuato ^a	21.2	0.0	0.4	3.6	0.6	0.6
12	Guerrero	29.2	0.1	0.5	5.0	0.9	0.9
13	Hidalgo ^a	13.4	0.0	0.2	2.3	0.4	0.4
14	Jalisco ^a	76.6	0.1	1.4	13.0	2.3	2.3
15	México ^b	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán ^a	63.6	0.1	1.1	10.8	1.9	1.9
17	Morelos ^a	14.3	0.0	0.3	2.4	0.4	0.4
18	Nayarit	14.7	0.0	0.3	2.5	0.4	0.4
19	Nuevo León	66.2	0.1	1.2	11.3	2.0	2.0
20	Oaxaca ^a	21.8	0.0	0.4	3.7	0.6	0.6
21	Puebla ^a	21.9	0.0	0.4	3.7	0.7	0.7
22	Querétaro ^b	0.0	0.0	0.0	0.0	0.0	0.0
23	Quintana Roo	12.3	0.0	0.2	2.1	0.4	0.4
24	San Luis Potosí ^a	11.6	0.0	0.2	2.0	0.3	0.3
25	Sinaloa ^a	23.1	0.0	0.4	3.9	0.7	0.7
26	Sonora ^a	51.3	0.1	0.9	8.7	1.5	1.5
27	Tabasco ^a	23.7	0.0	0.4	4.0	0.7	0.7
28	Tamaulipas ^a	57.7	0.1	1.0	9.8	1.7	1.7
29	Tlaxcala ^b	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz ^a	2.9	0.0	0.1	0.5	0.1	0.1
31	Yucatán ^b	0.0	0.0	0.0	0.0	0.0	0.0
32	Zacatecas ^a	40.3	0.1	0.7	6.9	1.2	1.2
National		709.4	0.9	12.7	120.7	21.1	21.1

^a States where area source fuel quantities were reconciled with point source fuel usage.

^b States where point source fuel usage exceeded area source fuel quantities; emissions zeroed out as part of point source fuel reconciliation.

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Commercial Fuel Combustion – LPG

DESCRIPTION:

Commercial combustion of liquefied petroleum gas (LPG). Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- State level LPG usage by sector (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000b; SENER, 2001b; SENER, 2002b)
- Municipality level employee statistics for the commercial sector (CMAP 50-97) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 1.752 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- SO_x – 0.00464 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- VOC – 0.0432 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- CO – 0.2424 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- PM – 0.0552 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])

NOTES AND ASSUMPTIONS:

- LPG is assumed to contain 60% propane and 40% butane.
- Sulfur content of propane fraction and butane fraction is assumed to be 0.4114 gr/100 ft³.
- Emission factor for total PM is assumed to represent PM₁₀ and PM_{2.5} emissions.

SAMPLE CALCULATIONS:

Estimate annual emissions from commercial LPG usage in Baja California.

State level emissions:

Commercial LPG usage in Baja California = 82,929 m³/year = 82,929,000 liters/year

Annual NO_x emissions = 1.752 kg/1,000 liters × (82,929,000 liters) = 145,292 kg = 145.3 Mg

Annual SO_x emissions = 0.00464 kg/1,000 liters × (82,929,000 liters) = 385 kg = 0.4 Mg

Annual VOC emissions = 0.0432 kg/1,000 liters × (82,929,000 liters) = 3,583 kg = 3.6 Mg

Annual CO emissions = 0.2424 kg/1,000 liters × (82,929,000 liters) = 20,102 kg = 20.1 Mg

Annual PM₁₀ emissions = 0.0552 kg/1,000 liters × (82,929,000 liters) = 4,578 kg = 4.6 Mg

Annual PM_{2.5} emissions = 4.6 Mg

Municipality level emissions – Mexicali:

Number of employees in Mexicali in the commercial sector = 70,826

Ratio of municipality level employees to state level employees in the commercial sector = 70,826/258,796 = 0.274

Annual NO_x emissions = 145.3 Mg × 0.274 = 39.8 Mg

Annual SO_x emissions = 0.4 Mg × 0.274 = 0.1 Mg

Annual VOC emissions = 3.6 Mg × 0.274 = 1.0 Mg

Annual CO emissions = 20.1 Mg × 0.274 = 5.5 Mg

Annual PM₁₀ emissions = 4.6 Mg × 0.274 = 1.3 Mg

Annual PM_{2.5} emissions = 1.3 Mg

Commercial Fuel Combustion – LPG								
State Code	State Name	Annual Emissions (Mg/year)						
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	
01	Aguascalientes	65.0	0.2	1.6	9.0	2.0	2.0	0.0
02	Baja California	145.3	0.4	3.6	20.1	4.6	4.6	0.0
03	Baja California Sur	18.4	0.0	0.5	2.5	0.6	0.6	0.0
04	Campeche	13.2	0.0	0.3	1.8	0.4	0.4	0.0
05	Coahuila	178.5	0.5	4.4	24.7	5.6	5.6	0.0
06	Colima	23.5	0.1	0.6	3.3	0.7	0.7	0.0
07	Chiapas	98.8	0.3	2.4	13.7	3.1	3.1	0.0
08	Chihuahua	205.6	0.5	5.1	28.4	6.5	6.5	0.0
09	Distrito Federal	269.2	0.7	6.6	37.2	8.5	8.5	0.0
10	Durango	46.5	0.1	1.1	6.4	1.5	1.5	0.0
11	Guanajuato	206.0	0.6	5.1	28.5	6.5	6.5	0.0
12	Guerrero	66.2	0.2	1.6	9.2	2.1	2.1	0.0
13	Hidalgo	88.2	0.2	2.2	12.2	2.8	2.8	0.0
14	Jalisco	324.2	0.9	8.0	44.9	10.2	10.2	0.0
15	México	973.8	2.6	24.0	134.7	30.7	30.7	0.0
16	Michoacán	168.1	0.4	4.1	23.3	5.3	5.3	0.0
17	Morelos	87.7	0.2	2.2	12.1	2.8	2.8	0.0
18	Nayarit	33.4	0.1	0.8	4.6	1.1	1.1	0.0
19	Nuevo León	149.9	0.4	3.7	20.7	4.7	4.7	0.0
20	Oaxaca	54.6	0.1	1.3	7.6	1.7	1.7	0.0
21	Puebla	203.7	0.5	5.0	28.2	6.4	6.4	0.0
22	Querétaro	70.0	0.2	1.7	9.7	2.2	2.2	0.0
23	Quintana Roo	27.8	0.1	0.7	3.9	0.9	0.9	0.0
24	San Luis Potosí	83.3	0.2	2.1	11.5	2.6	2.6	0.0
25	Sinaloa	107.8	0.3	2.7	14.9	3.4	3.4	0.0
26	Sonora	140.9	0.4	3.5	19.5	4.4	4.4	0.0
27	Tabasco	53.8	0.1	1.3	7.4	1.7	1.7	0.0
28	Tamaulipas	130.7	0.3	3.2	18.1	4.1	4.1	0.0
29	Tlaxcala	75.9	0.2	1.9	10.5	2.4	2.4	0.0
30	Veracruz	226.5	0.6	5.6	31.3	7.1	7.1	0.0
31	Yucatán	41.8	0.1	1.0	5.8	1.3	1.3	0.0
32	Zacatecas	92.6	0.2	2.3	12.8	2.9	2.9	0.0
National		4,470.9	11.7	110.2	618.5	140.8	140.8	0.0

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Residential Fuel Combustion – LPG

DESCRIPTION:

Residential combustion of liquefied petroleum gas (LPG) for heating and cooking.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- State level LPG usage by sector (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000b; SENER, 2001b; SENER, 2002b)
- Municipality level household statistics (INEGI, 2000a)

EMISSION FACTORS:

- NO_x – 1.752 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- SO_x – 0.00464 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- VOC – 0.0432 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- CO – 0.2424 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- PM – 0.0552 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])

NOTES AND ASSUMPTIONS:

- LPG is assumed to contain 60% propane and 40% butane.
- Sulfur content of propane fraction and butane fraction is assumed to be 0.4114 gr/100 ft³.
- Emission factor for total PM is assumed to represent PM₁₀ and PM_{2.5} emissions.
- Residential LPG emission factors are assumed to be equivalent to commercial LPG emission factors.

SAMPLE CALCULATIONS:

Estimate annual emissions from residential LPG usage in Baja California.

State level emissions:

Residential LPG usage in Baja California = 418,326 m³/year = 418,326,000 liters/year

Annual NO_x emissions = 1.752 kg/1,000 liters × (418,326,000 liters) = 732,907 kg = 732.9 Mg
Annual SO_x emissions = 0.00464 kg/1,000 liters × (418,326,000 liters) = 1,941 kg = 1.9 Mg
Annual VOC emissions = 0.0432 kg/1,000 liters × (418,326,000 liters) = 18,072 kg = 18.1 Mg
Annual CO emissions = 0.2424 kg/1,000 liters × (418,326,000 liters) = 101,402 kg = 101.4 Mg
Annual PM₁₀ emissions = 0.0552 kg/1,000 liters × (418,326,000 liters) = 23,092 kg = 23.1 Mg
Annual PM_{2.5} emissions = 23.1 Mg

Municipality level emission – Mexicali:

Number of households in Mexicali = 190,426

Ratio of municipality level households to state level households = 190,426/610,057 = 0.312

Annual NO_x emissions = 732.9 Mg × 0.312 = 228.8 Mg
Annual SO_x emissions = 1.9 Mg × 0.312 = 0.6 Mg
Annual VOC emissions = 18.1 Mg × 0.312 = 5.6 Mg
Annual CO emissions = 101.4 Mg × 0.312 = 31.7 Mg
Annual PM₁₀ emissions = 23.1 Mg × 0.312 = 7.2 Mg
Annual PM_{2.5} emissions = 7.2 Mg

Residential Fuel Combustion – LPG							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	327.9	0.9	8.1	45.4	10.3	10.3
02	Baja California	732.9	1.9	18.1	101.4	23.1	23.1
03	Baja California Sur	92.6	0.2	2.3	12.8	2.9	2.9
04	Campeche	66.6	0.2	1.6	9.2	2.1	2.1
05	Coahuila	900.6	2.4	22.2	124.6	28.4	28.4
06	Colima	118.7	0.3	2.9	16.4	3.7	3.7
07	Chiapas	498.6	1.3	12.3	69.0	15.7	15.7
08	Chihuahua	1,037.0	2.7	25.6	143.5	32.7	32.7
09	Distrito Federal	1,357.7	3.6	33.5	187.8	42.8	42.8
10	Durango	234.5	0.6	5.8	32.4	7.4	7.4
11	Guanajuato	1,039.4	2.8	25.6	143.8	32.7	32.7
12	Guerrero	334.1	0.9	8.2	46.2	10.5	10.5
13	Hidalgo	444.7	1.2	11.0	61.5	14.0	14.0
14	Jalisco	1,635.4	4.3	40.3	226.3	51.5	51.5
15	México	4,912.2	13.0	121.1	679.6	154.8	154.8
16	Michoacán	847.8	2.2	20.9	117.3	26.7	26.7
17	Morelos	442.3	1.2	10.9	61.2	13.9	13.9
18	Nayarit	168.6	0.4	4.2	23.3	5.3	5.3
19	Nuevo León	756.4	2.0	18.6	104.6	23.8	23.8
20	Oaxaca	275.6	0.7	6.8	38.1	8.7	8.7
21	Puebla	1,027.4	2.7	25.3	142.2	32.4	32.4
22	Querétaro	353.2	0.9	8.7	48.9	11.1	11.1
23	Quintana Roo	140.4	0.4	3.5	19.4	4.4	4.4
24	San Luis Potosí	420.0	1.1	10.4	58.1	13.2	13.2
25	Sinaloa	543.8	1.4	13.4	75.2	17.1	17.1
26	Sonora	710.6	1.9	17.5	98.3	22.4	22.4
27	Tabasco	271.2	0.7	6.7	37.5	8.5	8.5
28	Tamaulipas	659.4	1.7	16.3	91.2	20.8	20.8
29	Tlaxcala	382.8	1.0	9.4	53.0	12.1	12.1
30	Veracruz	1,142.5	3.0	28.2	158.1	36.0	36.0
31	Yucatán	210.9	0.6	5.2	29.2	6.6	6.6
32	Zacatecas	466.9	1.2	11.5	64.6	14.7	14.7
National		22,552.7	59.4	556.1	3,120.1	710.3	710.3

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Agricultural Fuel Combustion – LPG

DESCRIPTION:

Agricultural combustion of liquefied petroleum gas (LPG) for agricultural operations. Emission sources include machinery like pump sets, generators, turbines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- State level LPG usage by sector (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000b; SENER, 2001b; SENER, 2002b)
- Municipality level employee statistics in the agricultural sector (CMAP 0-20) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 1.752 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- SO_x – 0.00464 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- VOC – 0.0432 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- CO – 0.2424 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])
- Total PM – 0.0552 kg/1,000 liters (U.S. EPA, 1995 [Section 1.5 – Updated October 1996])

NOTES AND ASSUMPTIONS:

- LPG is assumed to contain 60% propane and 40% butane.
- Sulfur content of propane fraction and butane fraction is assumed to be 0.4114 gr/100 ft³.
- Emission factor for total PM is assumed to represent PM₁₀ and PM_{2.5} emissions.
- Agricultural LPG emission factors are assumed to be equivalent to commercial LPG emission factors.

SAMPLE CALCULATIONS:

Estimate annual emissions from agricultural LPG usage in Baja California.

State level emissions:

Agricultural LPG usage in Baja California = 1,804 m³/year = 1,804,000 liters/year

Annual NO_x emissions = 1.752 kg/1,000 liters × (1,804,000 liters) = 3,161 kg = 3.2 Mg

Annual SO_x emissions = 0.00464 kg/1,000 liters × (1,804,000 liters) = 8 kg = 0.0 Mg

Annual VOC emissions = 0.0432 kg/1,000 liters × (1,804,000 liters) = 78 kg = 0.1 Mg

Annual CO emissions = 0.2424 kg/1,000 liters × (1,804,000 liters) = 437 kg = 0.4 Mg

Annual PM₁₀ emissions = 0.0552 kg/1,000 liters × (1,804,000 liters) = 100 kg = 0.1 Mg

Annual PM_{2.5} emissions = 0.1 Mg

Municipality level emissions – Mexicali:

Number of employees in Mexicali in the agricultural sector = 731

Ratio of municipality level of employees to state level employees in the agricultural sector = 731/4,513 = 0.162

Annual NO_x emissions = 3.2 Mg × 0.162 = 0.5 Mg

Annual SO_x emissions = 0.0 Mg × 0.162 = 0.0 Mg

Annual VOC emissions = 0.1 Mg × 0.162 = 0.0 Mg

Annual CO emissions = 0.4 Mg × 0.162 = 0.1 Mg

Annual PM₁₀ emissions = 0.1 Mg × 0.162 = 0.0 Mg

Annual PM_{2.5} emissions = 0.0 Mg

Agricultural Fuel Combustion – LPG							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	1.4	0.0	0.0	0.2	0.0	0.0
02	Baja California	3.2	0.0	0.1	0.4	0.1	0.1
03	Baja California Sur	0.4	0.0	0.0	0.1	0.0	0.0
04	Campeche	0.3	0.0	0.0	0.0	0.0	0.0
05	Coahuila	3.9	0.0	0.1	0.5	0.1	0.1
06	Colima	0.5	0.0	0.0	0.1	0.0	0.0
07	Chiapas	2.2	0.0	0.1	0.3	0.1	0.1
08	Chihuahua	4.5	0.0	0.1	0.6	0.1	0.1
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	1.0	0.0	0.0	0.1	0.0	0.0
11	Guanajuato	4.5	0.0	0.1	0.6	0.1	0.1
12	Guerrero	1.4	0.0	0.0	0.2	0.0	0.0
13	Hidalgo	1.9	0.0	0.0	0.3	0.1	0.1
14	Jalisco	7.1	0.0	0.2	1.0	0.2	0.2
15	México	21.2	0.1	0.5	2.9	0.7	0.7
16	Michoacán	3.7	0.0	0.1	0.5	0.1	0.1
17	Morelos	1.9	0.0	0.0	0.3	0.1	0.1
18	Nayarit	0.7	0.0	0.0	0.1	0.0	0.0
19	Nuevo León	3.3	0.0	0.1	0.5	0.1	0.1
20	Oaxaca	1.2	0.0	0.0	0.2	0.0	0.0
21	Puebla	4.4	0.0	0.1	0.6	0.1	0.1
22	Querétaro	1.5	0.0	0.0	0.2	0.0	0.0
23	Quintana Roo	0.6	0.0	0.0	0.1	0.0	0.0
24	San Luis Potosí	1.8	0.0	0.0	0.3	0.1	0.1
25	Sinaloa	2.3	0.0	0.1	0.4	0.1	0.1
26	Sonora	3.1	0.0	0.1	0.4	0.1	0.1
27	Tabasco	1.2	0.0	0.0	0.2	0.0	0.0
28	Tamaulipas	2.8	0.0	0.1	0.4	0.1	0.1
29	Tlaxcala	1.7	0.0	0.0	0.2	0.1	0.1
30	Veracruz	4.9	0.0	0.1	0.7	0.2	0.2
31	Yucatán	0.9	0.0	0.0	0.1	0.0	0.0
32	Zacatecas	2.0	0.0	0.1	0.3	0.1	0.1
National		91.5	0.1	1.9	12.8	2.7	2.7

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Transportation Fuel Combustion – LPG

DESCRIPTION:

Combustion of liquefied petroleum gas (LPG) by on-road motor vehicles.

POLLUTANTS:

NO_x, VOC, and CO

METHOD:

Emission factors

ACTIVITY DATA:

- State level LPG usage by sector (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000b; SENER, 2001b; SENER, 2002b)
- Population (INEGI, 2000a)

EMISSION FACTORS:

- NO_x – 20.41 g/liter (PEMEX, 1997)
- VOC – 12.58 g/liter (PEMEX, 1997)
- CO – 126.72 g/liter (PEMEX, 1997)

NOTES AND ASSUMPTIONS:

- LPG transportation fuel combustion was not included in the estimation of on-road motor vehicle emissions.
- Fuel economy was assumed to be 6.32 km/liter (PEMEX, 1997).
- LPG usage by the transportation sector was assumed to be uniform throughout the country.

SAMPLE CALCULATIONS:

Estimate annual emissions from transportation LPG usage in Baja California.

State level emissions:

Transportation LPG usage in Baja California = 71,522.14 m³/year = 71,522,142 liters/year

Annual NO_x emissions = 20.41 g/liter × 71,522,142 liters/1,000,000 = 1,460.0 Mg

Annual VOC emissions = 12.58 g/liter × 71,522,142 liter/1,000,000 = 899.5 Mg

Annual CO emissions = 126.72 g/liter × 71,522,142 liter/1,000,000 = 9,063.3 Mg

Municipality level emission – Mexicali:

Population of Mexicali = 764,602

Population of Baja California = 2,487,367

Transportation LPG usage in Mexicali = 71,522,142 liters/year × (764,602/2,487,367) = 21,985,486 liters/year

Annual NO_x emissions = (21,985,486 liters × 20.41 g/liter)/1,000,000 = 448.8 Mg

Annual VOC emissions = (21,985,486 liters × 12.58 g/liter)/1,000,000 = 276.5 Mg

Annual CO emissions = (21,985,486 liters × 126.72 g/liter)/1,000,000 = 2,785.9 Mg

Transportation Fuel Combustion – LPG							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	653.1	0.0	402.4	4,054.4	0.0	0.0
02	Baja California	1,460.0	0.0	899.5	9,063.0	0.0	0.0
03	Baja California Sur	184.5	0.0	113.7	1,145.3	0.0	0.0
04	Campeche	132.6	0.0	81.7	823.4	0.0	0.0
05	Coahuila	1,794.1	0.0	1,105.3	11,136.8	0.0	0.0
06	Colima	236.4	0.0	145.7	1,467.6	0.0	0.0
07	Chiapas	993.2	0.0	611.9	6,165.4	0.0	0.0
08	Chihuahua	2,065.8	0.0	1,272.8	12,823.5	0.0	0.0
09	Distrito Federal	2,704.7	0.0	1,666.4	16,789.2	0.0	0.0
10	Durango	467.2	0.0	287.8	2,899.9	0.0	0.0
11	Guanajuato	2,070.5	0.0	1,275.6	12,852.5	0.0	0.0
12	Guerrero	665.5	0.0	410.0	4,131.1	0.0	0.0
13	Hidalgo	885.9	0.0	545.8	5,498.9	0.0	0.0
14	Jalisco	3,257.9	0.0	2,007.2	20,223.1	0.0	0.0
15	México	9,785.6	0.0	6,028.9	60,743.5	0.0	0.0
16	Michoacán	1,688.9	0.0	1,040.5	10,483.5	0.0	0.0
17	Morelos	881.1	0.0	542.9	5,469.6	0.0	0.0
18	Nayarit	335.8	0.0	206.9	2,084.5	0.0	0.0
19	Nuevo León	1,506.7	0.0	928.3	9,352.9	0.0	0.0
20	Oaxaca	549.0	0.0	338.2	3,408.0	0.0	0.0
21	Puebla	2,046.7	0.0	1,261.0	12,705.1	0.0	0.0
22	Querétaro	703.6	0.0	433.5	4,367.8	0.0	0.0
23	Quintana Roo	279.7	0.0	172.3	1,736.1	0.0	0.0
24	San Luis Potosí	836.6	0.0	515.4	5,193.0	0.0	0.0
25	Sinaloa	1,083.3	0.0	667.4	6,724.3	0.0	0.0
26	Sonora	1,415.6	0.0	872.1	8,787.1	0.0	0.0
27	Tabasco	540.3	0.0	332.9	3,353.7	0.0	0.0
28	Tamaulipas	1,313.6	0.0	809.3	8,154.0	0.0	0.0
29	Tlaxcala	762.6	0.0	469.8	4,733.9	0.0	0.0
30	Veracruz	2,276.0	0.0	1,402.2	14,127.9	0.0	0.0
31	Yucatán	420.2	0.0	258.9	2,608.5	0.0	0.0
32	Zacatecas	930.2	0.0	573.1	5,774.1	0.0	0.0
National		44,926.9	0.0	27,679.4	278,881.6	0.0	0.0

Activity Data Rating: A

Emission Factor Rating: B

Overall Rating: B

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Industrial Fuel Combustion – Natural Gas

DESCRIPTION:

Industrial combustion of natural gas. Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Annual natural gas quantity used in the industrial sector (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000c; SENER, 2001c; SENER, 2002c)
- Fraction of natural gas used as petrochemical feedstock (SENER, 2000c)
- National and municipality level industrial employee statistics (CMAP 21-23, 29, 31, 34-39) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 280 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- SO_x – 0.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- VOC – 5.5 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- CO – 84 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- PM₁₀ – 7.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- PM_{2.5} – 7.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])

NOTES AND ASSUMPTIONS:

- 100% natural gas usage in the industrial sector was assumed to be for combustion; 71% natural gas usage in the petrochemicals sector was assumed to be for combustion and the rest used as feedstock.
- SENER divided states into 5 major geographical zones: Northeast (NE) zone consists of Chihuahua, Durango, Coahuila, Nuevo León, and Tamaulipas; Northwest (NW) zone consists of Baja California, Baja California Sur, Sinaloa, and Sonora; Central zone consists of Distrito Federal, Hidalgo, México, Morelos, Puebla, and Tlaxcala; Central West zone consists of Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, Querétaro, and San Luis Potosí; and the South-Southwest zone consists of Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán.
- Industrial area source natural gas quantities were reconciled with the industrial point source inventory by subtracting point source inventory natural gas quantities from the area source natural gas quantities.

SAMPLE CALCULATIONS:

Estimate annual emissions from industrial natural gas usage in Baja California.

Annual quantity of natural gas used in the industrial sector in the NW and NE zones = 161,330 10⁶ ft³

Annual quantity of natural gas used in the petrochemicals sector in the NW and NE zones = 259 10⁶ ft³

Total annual quantity of natural gas used in the NW and NE zones= 161,330 + 259 = 161,589 10⁶ ft³/year

State level emissions:

Total number of employees in industrial sector in the NW and NE zones = 1,605,365

Total number of employees in industrial sector in Baja California = 249,176

Baja California natural gas use = 161,589 10⁶ ft³/year × (249,176/1,605,365) = 25,081 10⁶ ft³/year = 710.3 10⁶ m³/year

Point source inventory natural gas usage in Baja California = 226.7 10⁶ m³/year

Reconciled industrial area source natural gas usage = 710.3 – 226.7 = 483.6 10⁶ m³/year

Annual NO_x emissions = (280 lb/10⁶ ft³) × (1 kg/2.205 lbs) × (35.31 ft³/m³) × 483.6 10⁶ m³ × 1 Mg/1000 kg = 2,169.5 Mg

Municipality level emissions – Mexicali:

Number of employees in Mexicali in the industrial sector = 61,822

Annual NO_x emissions = (61,822/249,176) × 2,169.5 Mg = 538.3 Mg

Industrial Fuel Combustion – Natural Gas								
State Code	State Name	Annual Emissions (Mg/year)						
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	
01	Aguascalientes ^a	847.3	1.8	16.6	254.2	23.0	23.0	0.0
02	Baja California ^a	2,169.5	4.6	42.6	650.9	58.9	58.9	0.0
03	Baja California Sur	175.5	0.4	3.4	52.6	4.8	4.8	0.0
04	Campeche ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
05	Coahuila ^a	928.9	2.0	18.2	278.7	25.2	25.2	0.0
06	Colima	139.2	0.3	2.7	41.8	3.8	3.8	0.0
07	Chiapas ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08	Chihuahua ^a	3,368.7	7.2	66.2	1,010.6	91.4	91.4	0.0
09	Distrito Federal ^a	2,250.4	4.8	44.2	675.1	61.1	61.1	0.0
10	Durango ^a	849.6	1.8	16.7	254.9	23.1	23.1	0.0
11	Guanajuato ^a	2,538.1	5.4	49.9	761.4	68.9	68.9	0.0
12	Guerrero	1,740.9	3.7	34.2	522.3	47.3	47.3	0.0
13	Hidalgo ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco ^a	2,140.9	4.6	42.1	642.3	58.1	58.1	0.0
15	México ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán ^a	980.1	2.1	19.3	294.0	26.6	26.6	0.0
17	Morelos	358.0	0.8	7.0	107.4	9.7	9.7	0.0
18	Nayarit	153.2	0.3	3.0	46.0	4.2	4.2	0.0
19	Nuevo León ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Oaxaca ^a	21.6	0.0	0.4	6.5	0.6	0.6	0.0
21	Puebla ^a	700.7	1.5	13.8	210.2	19.0	19.0	0.0
22	Querétaro ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	Quintana Roo	434.9	0.9	8.5	130.5	11.8	11.8	0.0
24	San Luis Potosí ^a	266.6	0.6	5.2	80.0	7.2	7.2	0.0
25	Sinaloa	529.2	1.1	10.4	158.8	14.4	14.4	0.0
26	Sonora ^a	1,318.8	2.8	25.9	395.6	35.8	35.8	0.0
27	Tabasco ^a	1,353.6	2.9	26.6	406.1	36.7	36.7	0.0
28	Tamaulipas ^a	1,567.8	3.4	30.8	470.3	42.6	42.6	0.0
29	Tlaxcala ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	Yucatán	3,213.4	6.9	63.1	964.0	87.2	87.2	0.0
32	Zacatecas	356.7	0.8	7.0	107.0	9.7	9.7	0.0
National		28,403.6	60.7	557.8	8,521.2	771.1	771.1	0.0

^a States where area source fuel quantities were reconciled with point source fuel usage.

^b States where point source fuel usage exceeded area source fuel quantities; emissions zeroed out as part of point source fuel reconciliation.

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Commercial Fuel Combustion – Natural Gas

DESCRIPTION:

Commercial combustion of natural gas. Emission sources include boilers, furnaces, heaters, IC engines, etc.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Annual natural gas quantity used in the commercial sector (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000c; SENER, 2001c; SENER, 2002c)
- National and municipality level employee statistics for the commercial sector (CMAP 50-97) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 100 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- SO_x – 0.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- VOC – 5.5 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- CO – 84 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- PM₁₀ – 7.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- PM_{2.5} – 7.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])

NOTES AND ASSUMPTIONS:

- SENER divided states into 5 major geographical zones: Northeast (NE) zone consists of Chihuahua, Durango, Coahuila, Nuevo León, and Tamaulipas; Northwest (NW) zone consists of Baja California, Baja California Sur, Sinaloa, and Sonora; Central zone consists of Distrito Federal, Hidalgo, México, Morelos, Puebla, and Tlaxcala; Central West zone consists of Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, Querétaro, and San Luis Potosí; and the South-Southwest zone consists of Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán.
- In the Northeast zone, commercial/residential natural gas split was 0.254/0.746; in Northwest zone, commercial/residential split was 0.000/1.000; in the central zone the commercial/residential natural gas split was 0.833/0.167; and in the Central West zone the split was 0.5/0.5.
- In 1999, commercial natural gas distribution occurred only in the following distribution areas: Chihuahua, Juárez, Monterrey, Nuevo Laredo, Piedras Negras, Saltillo, Distrito Federal, Querétaro, and Valle Cuautitlan-Texcoco (SENER, 2000c).

SAMPLE CALCULATIONS:

Estimate annual emissions from commercial natural gas usage in Nuevo León.

State level emissions:

Annual quantity of natural gas used in the commercial sector in Nuevo León = 4,253.0 10⁶ ft³/year

$$\text{Annual NO}_x \text{ emissions} = 100 \text{ lb}/10^6 \text{ ft}^3 \times 4,253.0 10^6 \text{ ft}^3/\text{year} \times (1 \text{ kg}/2,205 \text{ lb}) \times (1 \text{ Mg}/1000 \text{ kg}) = 192.9 \text{ Mg}$$

$$\text{Annual SO}_x \text{ emissions} = 0.6 \text{ lb}/10^6 \text{ ft}^3 \times 4,253.0 10^6 \text{ ft}^3/\text{year} \times (1 \text{ kg}/2,205 \text{ lb}) \times (1 \text{ Mg}/1000 \text{ kg}) = 1.2 \text{ Mg}$$

$$\text{Annual VOC emissions} = 5.5 \text{ lb}/10^6 \text{ ft}^3 \times 4,253.0 10^6 \text{ ft}^3/\text{year} \times (1 \text{ kg}/2,205 \text{ lb}) \times (1 \text{ Mg}/1000 \text{ kg}) = 10.6 \text{ Mg}$$

$$\text{Annual CO emissions} = 84 \text{ lb}/10^6 \text{ ft}^3 \times 4,253.0 10^6 \text{ ft}^3/\text{year} \times (1 \text{ kg}/2,205 \text{ lb}) \times (1 \text{ Mg}/1000 \text{ kg}) = 162.0 \text{ Mg}$$

$$\text{Annual PM}_{10} \text{ emissions} = 7.6 \text{ lb}/10^6 \text{ ft}^3 \times 4,253.0 10^6 \text{ ft}^3/\text{year} \times (1 \text{ kg}/2,205 \text{ lb}) \times (1 \text{ Mg}/1000 \text{ kg}) = 14.7 \text{ Mg}$$

$$\text{Annual PM}_{2.5} \text{ emissions} = 7.6 \text{ lb}/10^6 \text{ ft}^3 \times 4,253.0 10^6 \text{ ft}^3/\text{year} \times (1 \text{ kg}/2,205 \text{ lb}) \times (1 \text{ Mg}/1000 \text{ kg}) = 14.7 \text{ Mg}$$

Municipality level emissions – Monterrey:

Number of employees in Monterrey in the commercial sector = 276,643

Number of employees in Nuevo León in the commercial sector = 490,729

$$\text{Annual NO}_x \text{ emissions} = 192.9 \text{ Mg} \times (276,643/490,729) = 108.7 \text{ Mg}$$

$$\text{Annual SO}_x \text{ emissions} = 1.2 \text{ Mg} \times (276,643/490,729) = 0.7 \text{ Mg}$$

$$\text{Annual VOC emissions} = 10.6 \text{ Mg} \times (276,643/490,729) = 6.0 \text{ Mg}$$

$$\text{Annual CO emissions} = 162.0 \text{ Mg} \times (276,643/490,729) = 91.3 \text{ Mg}$$

$$\text{Annual PM}_{10} \text{ emissions} = 14.7 \text{ Mg} \times (276,643/490,729) = 8.3 \text{ Mg}$$

$$\text{Annual PM}_{2.5} \text{ emissions} = 14.7 \text{ Mg} \times (276,643/490,729) = 8.3 \text{ Mg}$$

Commercial Fuel Combustion – Natural Gas							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	0.0
02	Baja California	0.0	0.0	0.0	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	0.0	0.0	0.0	0.0
05	Coahuila	15.3	0.1	0.8	12.8	1.2	1.2
06	Colima	0.0	0.0	0.0	0.0	0.0	0.0
07	Chiapas	0.0	0.0	0.0	0.0	0.0	0.0
08	Chihuahua	66.2	0.4	3.6	55.6	5.0	5.0
09	Distrito Federal	7.8	0.0	0.4	6.6	0.6	0.6
10	Durango	0.0	0.0	0.0	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	0.0
12	Guerrero	0.0	0.0	0.0	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco	0.0	0.0	0.0	0.0	0.0	0.0
15	México	5.1	0.0	0.3	4.3	0.4	0.4
16	Michoacán	0.0	0.0	0.0	0.0	0.0	0.0
17	Morelos	0.0	0.0	0.0	0.0	0.0	0.0
18	Nayarit	0.0	0.0	0.0	0.0	0.0	0.0
19	Nuevo León	192.9	1.2	10.6	162.0	14.7	14.7
20	Oaxaca	0.0	0.0	0.0	0.0	0.0	0.0
21	Puebla	0.0	0.0	0.0	0.0	0.0	0.0
22	Querétaro	9.1	0.1	0.5	7.6	0.7	0.7
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	0.0	0.0	0.0	0.0
26	Sonora	0.0	0.0	0.0	0.0	0.0	0.0
27	Tabasco	0.0	0.0	0.0	0.0	0.0	0.0
28	Tamaulipas	8.3	0.0	0.5	7.0	0.6	0.6
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz	0.0	0.0	0.0	0.0	0.0	0.0
31	Yucatán	0.0	0.0	0.0	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	0.0
National		304.7	1.8	16.7	255.9	23.2	23.2

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Residential Fuel Combustion – Natural Gas

DESCRIPTION:

Residential combustion of natural gas for heating and cooking.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emissions factors

ACTIVITY DATA:

- Annual natural gas quantity used in residential homes (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000c; SENER, 2001c; SENER, 2002c)
- Municipality level household statistics (INEGI, 2000a)

EMISSION FACTORS:

- NO_x – 94 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- SO_x – 0.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- VOC – 5.5 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- CO – 40 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- PM₁₀ – 7.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])
- PM_{2.5} – 7.6 lb/10⁶ scf (U.S. EPA, 1995 [Section 1.4 – Updated July 1998])

NOTES AND ASSUMPTIONS:

- SENER divided states into 5 major geographical zones: Northeast (NE) zone consists of Chihuahua, Durango, Coahuila, Nuevo León, and Tamaulipas; Northwest (NW) zone consists of Baja California, Baja California Sur, Sinaloa, and Sonora; Central zone consists of Distrito Federal, Hidalgo, México, Morelos, Puebla, and Tlaxcala; Central west zone consists of Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, Querétaro, and San Luis Potosí; and the South-Southwest zone consists of Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán.
- In the Northeast zone, commercial/residential natural gas split was 0.254/0.746; in the Northwest zone, commercial/residential split was 0.000/1.000; in the Central zone the commercial/residential natural gas split was 0.833/0.167; and in the Central-West zone the split was 0.5/0.5.
- In 1999, residential natural gas distribution only occurred in the following distribution areas: Cananea, Chihuahua, Juárez, Mexicali, Monterrey, Nuevo Laredo, Piedras Negras, Saltillo, Distrito Federal, Queretaro, and Valle Cuautitlan-Texcoco (SENER, 2000c).

SAMPLE CALCULATIONS:

Estimate annual emissions from residential natural gas usage in Nuevo León.

State level emissions:

Annual quantity of natural gas used in the residential sector in Nuevo León = 12,491 10⁶ ft³/year

Annual NO_x emissions = 94 lb/10⁶ ft³ × 12,491 10⁶ ft³/year × (1 kg/2.205 lb) × (1 Mg/1000 kg) = 532.5 Mg

Annual SO_x emissions = 0.6 lb/10⁶ ft³ × 12,491 10⁶ ft³/year × (1 kg/2.205 lb) × (1 Mg/1000 kg) = 3.4 Mg

Annual VOC emissions = 5.5 lb/10⁶ ft³ × 12,491 10⁶ ft³/year × (1 kg/2.205 lb) × (1 Mg/1000 kg) = 31.2 Mg

Annual CO emissions = 40 lb/10⁶ ft³ × 12,491 10⁶ ft³/year × (1 kg/2.205 lb) × (1 Mg/1000 kg) = 226.6 Mg

Annual PM₁₀ emissions = 7.6 lb/10⁶ ft³ × 12,491 10⁶ ft³/year × (1 kg/2.205 lb) × (1 Mg/1000 kg) = 43.1 Mg

Annual PM_{2.5} emissions = 7.6 lb/10⁶ ft³ × 12,491 10⁶ ft³/year × (1 kg/2.205 lb) × (1 Mg/1000 kg) = 43.1 Mg

Municipality level emissions – Monterrey:

Number of households in Monterrey = 256,073

Number of households in Nuevo León = 738,633

Annual NO_x emissions = 532.5 Mg × (256,073/738,633) = 184.6 Mg

Annual SO_x emissions = 3.4 Mg × (256,073/738,633) = 1.2 Mg

Annual VOC emissions = 31.2 Mg × (256,073/738,633) = 10.8 Mg

Annual CO emissions = 226.6 Mg × (256,073/738,633) = 78.6 Mg

Annual PM₁₀ emissions = 43.1 Mg × (256,073/738,633) = 14.9 Mg

Annual PM_{2.5} emissions = 43.1 Mg × (256,073/738,633) = 14.9 Mg

Residential Fuel Combustion – Natural Gas							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	0.0
02	Baja California	1.1	0.0	0.1	0.5	0.1	0.1
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	0.0	0.0	0.0	0.0
05	Coahuila	42.2	0.3	2.5	18.0	3.4	3.4
06	Colima	0.0	0.0	0.0	0.0	0.0	0.0
07	Chiapas	0.0	0.0	0.0	0.0	0.0	0.0
08	Chihuahua	182.8	1.2	10.7	77.8	14.8	14.8
09	Distrito Federal	36.6	0.2	2.1	15.6	3.0	3.0
10	Durango	0.0	0.0	0.0	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	0.0
12	Guerrero	0.0	0.0	0.0	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco	0.0	0.0	0.0	0.0	0.0	0.0
15	México	23.8	0.2	1.4	10.1	1.9	1.9
16	Michoacán	0.0	0.0	0.0	0.0	0.0	0.0
17	Morelos	0.0	0.0	0.0	0.0	0.0	0.0
18	Nayarit	0.0	0.0	0.0	0.0	0.0	0.0
19	Nuevo León	532.5	3.4	31.2	226.6	43.1	43.1
20	Oaxaca	0.0	0.0	0.0	0.0	0.0	0.0
21	Puebla	0.0	0.0	0.0	0.0	0.0	0.0
22	Querétaro	8.5	0.1	0.5	3.6	0.7	0.7
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	0.0	0.0	0.0	0.0
26	Sonora	21.4	0.1	1.3	9.1	1.7	1.7
27	Tabasco	0.0	0.0	0.0	0.0	0.0	0.0
28	Tamaulipas	23.0	0.1	1.3	9.8	1.9	1.9
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz	0.0	0.0	0.0	0.0	0.0	0.0
31	Yucatán	0.0	0.0	0.0	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	0.0
National		871.9	5.6	51.1	371.1	70.6	70.6

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Industrial Fuel Combustion – Kerosene

DESCRIPTION:

Industrial combustion of kerosene (diafano).

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National kerosene consumption in the industrial sector (ERG, 2003d; SENER, 2000a)
- Employee statistics from the industrial sector (CMAP 20-39) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 2.88 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- SO_x – 0.6594 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- VOC – 0.024 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- CO – 0.6 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- PM – 0.24 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])

NOTES AND ASSUMPTIONS:

- Particle size fraction for PM₁₀ is assumed to be 55% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Particle size fraction for PM_{2.5} is assumed to be 12% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Sulfur content of kerosene is assumed to be 0.035% by weight (PEMEX, 2003d).
- Industrial kerosene emission factors are assumed to be equivalent to industrial distillate emission factors.
- Industrial area source kerosene quantities were reconciled with the industrial point source inventory by subtracting point source inventory kerosene quantities from the area source kerosene quantities.

SAMPLE CALCULATIONS:

Estimate the total industrial kerosene combustion emissions in Baja California.

National level emissions:

National kerosene consumption 10,664,682.1 liters/year

National annual NO_x emissions = 10,664,682.1 liters × 2.88 kg/1000 liters = 30,714 kg = 30.7 Mg

State level emissions:

National level employees in industrial sector = 4,341,114

State level employees in industrial sector = 249,176

Annual NO_x emissions = 30.7 Mg × (249,176/4,341,114) = 1.8 Mg

Municipality level emissions – Mexicali:

Municipality level employees in industrial sector = 61,822

Annual NO_x emissions = 1.8 Mg × (61,822/249,176) = 0.4 Mg

Industrial Fuel Combustion – Kerosene							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.5	0.1	0.0	0.1	0.0	0.0
02	Baja California	1.8	0.4	0.0	0.4	0.1	0.0
03	Baja California Sur	0.1	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.1	0.0	0.0	0.0	0.0	0.0
05	Coahuila	1.4	0.3	0.0	0.3	0.1	0.0
06	Colima	0.1	0.0	0.0	0.0	0.0	0.0
07	Chiapas	0.2	0.1	0.0	0.1	0.0	0.0
08	Chihuahua	2.5	0.6	0.0	0.5	0.1	0.0
09	Distrito Federal ^a	2.4	0.6	0.0	0.5	0.1	0.0
10	Durango	0.5	0.1	0.0	0.1	0.0	0.0
11	Guanajuato	1.7	0.4	0.0	0.3	0.1	0.0
12	Guerrero	0.3	0.1	0.0	0.1	0.0	0.0
13	Hidalgo	0.5	0.1	0.0	0.1	0.0	0.0
14	Jalisco	2.3	0.5	0.0	0.5	0.1	0.0
15	México ^a	2.0	0.5	0.0	0.4	0.1	0.0
16	Michoacán	0.6	0.1	0.0	0.1	0.0	0.0
17	Morelos	0.3	0.1	0.0	0.1	0.0	0.0
18	Nayarit	0.1	0.0	0.0	0.0	0.0	0.0
19	Nuevo León	2.3	0.6	0.0	0.5	0.1	0.0
20	Oaxaca	0.4	0.1	0.0	0.1	0.0	0.0
21	Puebla	1.6	0.4	0.0	0.3	0.1	0.0
22	Querétaro	0.7	0.2	0.0	0.1	0.0	0.0
23	Quintana Roo	0.1	0.0	0.0	0.0	0.0	0.0
24	San Luis Potosí	0.5	0.1	0.0	0.1	0.0	0.0
25	Sinaloa	0.3	0.1	0.0	0.1	0.0	0.0
26	Sonora	1.0	0.2	0.0	0.2	0.0	0.0
27	Tabasco	0.2	0.1	0.0	0.0	0.0	0.0
28	Tamaulipas	1.4	0.3	0.0	0.3	0.1	0.0
29	Tlaxcala	0.4	0.1	0.0	0.1	0.0	0.0
30	Veracruz	1.0	0.2	0.0	0.2	0.0	0.0
31	Yucatán	0.5	0.1	0.0	0.1	0.0	0.0
32	Zacatecas	0.2	0.0	0.0	0.0	0.0	0.0
National		28.0	6.5	0.0	5.7	1.0	0.0

^a States where area source fuel quantities were reconciled with point source fuel usage.

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Residential Fuel Combustion – Kerosene

DESCRIPTION:

Residential combustion of kerosene for cooking.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National kerosene consumption in the residential sector (ERG, 2003d; SENER, 2000a)
- Municipality level household statistics (INEGI, 2000a)

EMISSION FACTORS:

- NO_x – 2.16 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- SO_x – 0.5964 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- VOC – 0.08556 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- CO – 0.6 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- PM – 0.048 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])

ASSUMPTIONS:

- Particle size fraction for PM₁₀ is assumed to be 55% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Particle size fraction for PM_{2.5} is assumed to be 42% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Sulfur content of kerosene is assumed to be 0.035% by weight (PEMEX, 2003d).

SAMPLE CALCULATIONS:

Estimate the total residential kerosene combustion emissions in Baja California.

National level emissions:

National residential kerosene consumption 32,158,546 liters/year

National annual NO_x emissions = (32,158,546 liters/1000) × 2.16 kg/1000 liters = 69,462 kg = 69.5 Mg

State level emissions:

National level number of households = 22,359,998

Number of households in Baja California = 610,057

Annual NO_x emissions = 69.5 Mg × (610,057/22,359,998) = 1.9 Mg

Municipality level emissions – Mexicali:

Number of households in the municipality of Mexicali = 190,426

Ratio of municipality level households to state level households = 190,426/610,057 = 0.3121

Annual NO_x emissions = 1.9 Mg × 0.3121 = 0.6 Mg

Residential Fuel Combustion – Kerosene							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.6	0.2	0.0	0.2	0.0	0.0
02	Baja California	1.9	0.5	0.1	0.5	0.0	0.0
03	Baja California Sur	0.3	0.1	0.0	0.1	0.0	0.0
04	Campeche	1.8	0.5	0.1	0.5	0.0	0.0
05	Coahuila	1.7	0.5	0.1	0.5	0.0	0.0
06	Colima	0.4	0.1	0.0	0.1	0.0	0.0
07	Chiapas	2.5	0.7	0.1	0.7	0.0	0.0
08	Chihuahua	2.3	0.6	0.1	0.7	0.0	0.0
09	Distrito Federal	6.6	1.8	0.3	1.8	0.1	0.1
10	Durango	1.0	0.3	0.0	0.3	0.0	0.0
11	Guanajuato	2.9	0.8	0.1	0.8	0.0	0.0
12	Guerrero	2.0	0.6	0.1	0.6	0.0	0.0
13	Hidalgo	1.5	0.4	0.1	0.4	0.0	0.0
14	Jalisco	4.3	1.2	0.2	1.2	0.1	0.0
15	México	9.0	2.5	0.4	2.5	0.1	0.1
16	Michoacán	2.7	0.7	0.1	0.7	0.0	0.0
17	Morelos	1.1	0.3	0.0	0.3	0.0	0.0
18	Nayarit	0.7	0.2	0.0	0.2	0.0	0.0
19	Nuevo León	2.8	0.8	0.1	0.8	0.0	0.0
20	Oaxaca	2.3	0.6	0.1	0.6	0.0	0.0
21	Puebla	3.3	0.9	0.1	0.9	0.0	0.0
22	Querétaro	0.9	0.3	0.0	0.3	0.0	0.0
23	Quintana Roo	0.7	0.2	0.0	0.2	0.0	0.0
24	San Luis Potosí	1.5	0.4	0.1	0.4	0.0	0.0
25	Sinaloa	1.8	0.5	0.1	0.5	0.0	0.0
26	Sonora	1.6	0.5	0.1	0.5	0.0	0.0
27	Tabasco	1.3	0.4	0.1	0.4	0.0	0.0
28	Tamaulipas	2.1	0.6	0.1	0.6	0.0	0.0
29	Tlaxcala	0.6	0.2	0.0	0.2	0.0	0.0
30	Veracruz	5.0	1.4	0.2	1.4	0.1	0.0
31	Yucatán	1.2	0.3	0.0	0.3	0.0	0.0
32	Zacatecas	0.9	0.3	0.0	0.3	0.0	0.0
National		69.3	19.4	2.8	19.5	0.4	0.2

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Agricultural Fuel Combustion – Kerosene

DESCRIPTION:

Agricultural consumption of kerosene (diafano).

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National kerosene consumption in the agricultural sector (ERG, 2003d; SENER, 2000a)
- Employee statistics from the agricultural sector (CMAP 0-20) (INEGI, 1999a)

EMISSION FACTORS:

- NO_x – 2.4 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- SO_x – 0.5964 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- VOC – 0.0408 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- CO – 0.6 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])
- PM – 0.24 kg/1000 liters (U.S. EPA, 1995 [Section 1.3 – Updated September 1998])

NOTES AND ASSUMPTIONS:

- Particle size fraction for PM₁₀ is assumed to be 55% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Particle size fraction for PM_{2.5} is assumed to be 42% of total PM (U.S. EPA, 1995 [Section 1.3 – Updated September 1998]).
- Sulfur content of kerosene is assumed to be 0.035% by weight (PEMEX, 2003d).
- Agricultural kerosene emission factors are assumed to be equivalent to commercial distillate emission factors.

SAMPLE CALCULATIONS:

Estimate the total agricultural kerosene combustion emissions in Baja California.

National level emissions:

National kerosene consumption 1,089,098.1 liters/year

National annual NO_x emissions = 1,089,098.1 liters × 2.4 kg/1000 liters = 2,613 kg = 2.6 Mg

State level emissions:

National level employees in the agricultural sector = 154,328

State level employees in the agricultural sector = 4,513

Annual NO_x emissions = 2.6 Mg × (4,513/154,328) = 0.08 Mg

Municipality level emissions – Mexicali:

Municipality level employees in the agricultural sector = 731

Annual NO_x emissions = 0.08 Mg × (731/4,513) = 0.01 Mg

Agricultural Fuel Combustion – Kerosene							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	0.0
02	Baja California	0.1	0.0	0.0	0.0	0.0	0.0
03	Baja California Sur	0.1	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.1	0.0	0.0	0.0	0.0	0.0
05	Coahuila	0.0	0.0	0.0	0.0	0.0	0.0
06	Colima	0.0	0.0	0.0	0.0	0.0	0.0
07	Chiapas	0.2	0.0	0.0	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	0.0	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	0.0	0.0	0.0	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	0.0
12	Guerrero	0.2	0.0	0.0	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco	0.1	0.0	0.0	0.0	0.0	0.0
15	México	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán	0.1	0.0	0.0	0.0	0.0	0.0
17	Morelos	0.0	0.0	0.0	0.0	0.0	0.0
18	Nayarit	0.1	0.0	0.0	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	0.0	0.0	0.0	0.0
20	Oaxaca	0.1	0.0	0.0	0.0	0.0	0.0
21	Puebla	0.0	0.0	0.0	0.0	0.0	0.0
22	Querétaro	0.0	0.0	0.0	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	0.0
25	Sinaloa	0.4	0.1	0.0	0.0	0.0	0.0
26	Sonora	0.2	0.1	0.0	0.1	0.0	0.0
27	Tabasco	0.2	0.0	0.0	0.0	0.0	0.0
28	Tamaulipas	0.1	0.0	0.0	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz	0.3	0.1	0.0	0.1	0.0	0.0
31	Yucatán	0.1	0.0	0.0	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	0.0
National		2.4	0.2	0.0	0.2	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Residential Fuel Combustion – Wood

DESCRIPTION:

Wood is used as a fuel in residential homes for cooking and heating.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors and annual firewood consumption

ACTIVITY DATA:

- Municipality level firewood consumption (Masera et al., 2003)

EMISSION FACTORS:

- NO_x – 1.4 kg/Mg (EIIP, 2001a)
- SO_x – 0.2 kg/Mg (EIIP, 2001a)
- VOC – 26.5 kg/Mg (EIIP, 2001a)
- CO – 115.4 kg/Mg (EIIP, 2001a)
- PM₁₀ – 15.3 kg/Mg (EIIP, 2001a)

NOTES AND ASSUMPTIONS:

- The PM_{2.5} fraction of PM₁₀ is 0.9627 (ARB, 2002).
- Emission factors are for U.S. conventional residential woodstoves.

SAMPLE CALCULATIONS:

Estimate the total residential wood combustion emissions in Baja California.

State level emissions – Baja California:

Annual residential wood consumption = 8,676.9 Mg (Masera et al., 2003)

Annual NO_x emissions – 8,676.9 Mg × 1.4 kg/Mg = 12,147 kg = 12.1 Mg

Annual SO_x emissions – 8,676.9 Mg × 0.2 kg/Mg = 1,735 kg = 1.7 Mg

Annual VOC emissions – 8,676.9 Mg × 26.5 kg/Mg = 229,937 kg = 229.9 Mg

Annual CO emissions – 8,676.9 Mg × 115.4 kg/Mg = 1,001,314 kg = 1,001.3 Mg

Annual PM₁₀ emissions – 8,676.9 Mg × 15.3 kg/Mg = 132,756 kg = 132.8 Mg

Annual PM_{2.5} emissions – 0.9627 × 132.7 Mg = 127.8 Mg

Municipality level emissions – Mexicali :

Annual residential firewood consumption = 2859.6 Mg (Masera et al., 2003)

Annual NO_x emissions – 2,859.6 Mg × 1.4 kg/Mg = 4.0 Mg

Annual SO_x emissions – 2,859.6 Mg × 0.2 kg/Mg = 0.6 Mg

Annual VOC emissions – 2,859.6 Mg × 26.5 kg/Mg = 75.8 Mg

Annual CO emissions – 2,859.6 Mg × 115.4 kg/Mg = 330.0 Mg

Annual PM₁₀ emissions – 2,859.6 Mg × 15.3 kg/Mg = 43.8 Mg

Annual PM_{2.5} emissions – 43.8 Mg × 0.9627 = 42.1 Mg

Residential Fuel Combustion – Wood								
State Code	State Name	Annual Emissions (Mg/year)						
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
01	Aguascalientes	21.2	3.0	401.9	1,750.2	232.0	223.4	0.0
02	Baja California	12.1	1.7	229.9	1,001.3	132.8	127.8	0.0
03	Baja California Sur	16.3	2.3	307.7	1,340.1	177.7	171.0	0.0
04	Campeche	254.9	36.4	4,825.2	21,012.5	2,785.9	2,682.0	0.0
05	Coahuila	47.4	6.8	897.9	3,910.0	518.4	499.1	0.0
06	Colima	63.8	9.1	1,206.8	5,255.3	696.8	670.8	0.0
07	Chiapas	2,591.5	370.2	49,053.7	213,614.8	28,321.5	27,265.2	0.0
08	Chihuahua	277.7	39.7	5,256.1	22,889.0	3,034.7	2,921.5	0.0
09	Distrito Federal	15.2	2.2	287.6	1,252.4	166.0	159.9	0.0
10	Durango	237.3	33.9	4,491.2	19,557.9	2,593.0	2,496.3	0.0
11	Guanajuato	627.0	89.6	11,868.0	51,681.8	6,852.1	6,596.5	0.0
12	Guerrero	1,678.8	239.8	31,777.8	138,383.5	18,347.2	17,662.9	0.0
13	Hidalgo	856.8	122.4	16,218.2	70,625.8	9,363.7	9,014.5	0.0
14	Jalisco	424.6	60.7	8,036.3	34,995.7	4,639.8	4,466.8	0.0
15	México	1,172.9	167.6	22,201.4	96,680.8	12,818.2	12,340.0	0.0
16	Michoacán	1,064.3	152.0	20,145.8	87,729.3	11,631.4	11,197.5	0.0
17	Morelos	196.0	28.0	3,710.9	16,159.7	2,142.5	2,062.6	0.0
18	Nayarit	158.0	22.6	2,990.3	13,021.8	1,726.5	1,662.1	0.0
19	Nuevo León	80.4	11.5	1,521.6	6,626.1	878.5	845.7	0.0
20	Oaxaca	2,305.1	329.3	43,632.6	190,007.8	25,191.7	24,252.0	0.0
21	Puebla	1,686.4	240.9	31,921.6	139,009.4	18,430.2	17,742.7	0.0
22	Querétaro	205.7	29.4	3,894.1	16,957.7	2,248.3	2,164.4	0.0
23	Quintana Roo	247.8	35.4	4,691.1	20,428.5	2,708.5	2,607.4	0.0
24	San Luis Potosí	800.9	114.4	15,159.7	66,016.4	8,752.6	8,426.1	0.0
25	Sinaloa	361.2	51.6	6,837.6	29,775.8	3,947.7	3,800.5	0.0
26	Sonora	139.9	20.0	2,648.8	11,534.8	1,529.3	1,472.3	0.0
27	Tabasco	648.6	92.7	12,276.5	53,460.6	7,087.9	6,823.5	0.0
28	Tamaulipas	177.8	25.4	3,365.2	14,654.5	1,942.9	1,870.5	0.0
29	Tlaxcala	140.4	20.1	2,657.7	11,573.6	1,534.5	1,477.2	0.0
30	Veracruz	3242.1	463.2	61,367.8	267,239.2	35,431.2	34,109.6	0.0
31	Yucatán	849.0	121.3	16,070.5	69,982.5	9,278.4	8,932.4	0.0
32	Zacatecas	160.6	22.9	3,039.3	13,235.2	1,754.8	1,689.3	0.0
National		20,761.7	2,966.1	392,990.8	1,711,364.0	226,896.7	218,433.5	0.0

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Locomotives

DESCRIPTION:

Emissions in this source category arise from line haul and yard operations. Line hauls locomotives travel between distant locations and yard locomotives are responsible for moving railcars within a particular railway yard.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National railroad fuel consumption (line haul and yard) (SCT, 1999)
- National railroad track length (ESRI, 2003)
- Municipality railroad track length (ESRI, 2003)

EMISSION FACTORS:

- Line haul locomotives: NO_x – 71.33 g/liter of fuel; SO_x – 0.64 g/liter of fuel; VOC – 2.64 g/liter of fuel; CO – 7.03 g/liter of fuel; PM₁₀ – 1.77 g/liter of fuel; and PM_{2.5} – 1.59 g/liter of fuel (ERG, 2003e)
- Yard locomotives: NO_x – 95.64 g/liter of fuel; SO_x – 0.64 g/liter of fuel; VOC – 5.55 g/liter of fuel; CO – 10.07 g/liter of fuel; PM₁₀ – 2.43 g/liter of fuel; and PM_{2.5} – 2.19 g/liter of fuel (ERG, 2003e)

NOTES AND ASSUMPTIONS:

- Weighted average fuel sulfur content is 0.037% (PEMEX, 2003d).

SAMPLE CALCULATIONS:

Estimate annual emissions from locomotives in Baja California.

National line haul fuel consumption = 589,300,000 liters

National yard fuel consumption = 15,200,000 liters

National railroad track length = 18,389.0 km

State railroad track length = 152.0 km

State level NO_x emissions:

Emissions from line haul operations:

State line haul fuel consumption = 589,300,000 liters × (152.0 km/18,389 km) = 4,871,042 liters/year

Annual line haul NO_x emissions = 71.33 g/liter × 4,871,042 liters = 347.5 Mg

Emissions from yard operations:

State yard fuel consumption = 15,200,000 liters × (152.0 km/18,389 km) = 125,640 liters/year

Annual yard NO_x emissions = 95.64 g/liter × 125,640 liters = 12.0 Mg

Total annual NO_x emissions = Line haul emissions + Yard emissions = 347.5 + 12.0 = 359.5 Mg

Municipality Level NO_x emissions – Mexicali:

Railroad track length in the municipality of Mexicali = 79.1 km

Annual NO_x emissions = (79.1 km/152 km) × 359.5 Mg = 187.1 Mg

Locomotives							
State Code	State Name	Annual Emissions (Mg/yr)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	302.3	2.7	11.4	29.9	7.5	6.7
02	Baja California	359.3	3.2	13.6	35.5	8.9	8.0
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche	813.1	7.2	30.7	80.3	20.2	18.1
05	Coahuila	3,531.1	31.4	133.2	348.8	87.7	78.8
06	Colima	313.8	2.8	11.8	31.0	7.8	7.0
07	Chiapas	1,171.8	10.4	44.2	115.8	29.1	26.1
08	Chihuahua	4,190.9	37.2	158.1	414.0	104.1	93.5
09	Distrito Federal	217.6	1.9	8.2	21.5	5.4	4.9
10	Durango	1,903.9	16.9	71.8	188.1	47.3	42.5
11	Guanajuato	1,837.3	16.3	69.3	181.5	45.6	41.0
12	Guerrero	187.8	1.7	7.1	18.5	4.7	4.2
13	Hidalgo	1,094.5	9.7	41.3	108.1	27.2	24.4
14	Jalisco	1,476.7	13.1	55.7	145.9	36.7	32.9
15	México	1,202.1	10.7	45.3	118.7	29.9	26.8
16	Michoacán	2,131.5	18.9	80.4	210.6	52.9	47.6
17	Morelos	667.1	5.9	25.2	65.9	16.6	14.9
18	Nayarit	665.7	5.9	25.1	65.8	16.5	14.9
19	Nuevo León	1,592.3	14.1	60.1	157.3	39.5	35.5
20	Oaxaca	1,397.2	12.4	52.7	138.0	34.7	31.2
21	Puebla	1,498.6	13.3	56.5	148.0	37.2	33.4
22	Querétaro	473.5	4.2	17.9	46.8	11.8	10.6
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	0.0
24	San Luis Potosí	1,923.6	17.1	72.5	190.0	47.8	42.9
25	Sinaloa	1,873.7	16.7	70.7	185.1	46.5	41.8
26	Sonora	4,369.2	38.8	164.8	431.6	108.5	97.5
27	Tabasco	632.9	5.6	23.9	62.5	15.7	14.1
28	Tamaulipas	1,562.3	13.9	58.9	154.3	38.8	34.9
29	Tlaxcala	629.1	5.6	23.7	62.1	15.6	14.0
30	Veracruz	2,797.5	24.9	105.5	276.3	69.5	62.4
31	Yucatán	1,226.9	10.9	46.3	121.2	30.5	27.4
32	Zacatecas	1,445.2	12.8	54.5	142.8	35.9	32.2
National		43,488.5	386.2	1,640.4	4,295.9	1,080.1	970.2
							0.0

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Aircraft

DESCRIPTION:

Emissions from aircraft engines during approach, taxi/idle-in, taxi/idle-out, takeoff, and climb out. Only those portions of the flight that occur between ground level and the mixing height are included in the inventory.

POLLUTANTS:

NO_x, SO_x, VOC, and CO

METHOD:

Emission factors

ACTIVITY DATA:

Landing and take-off (LTO) data (incoming flights) (INEGI, 2001; INEGI, 2002a)

EMISSION FACTORS:

- Emission indexes from the International Civil Aviation Organization (ICAO) Engine Exhaust Emissions Data Bank (Radian, 1997; ICAO, 1995)

NOTES AND ASSUMPTIONS:

- Aircraft fleet composition was assumed to be 36.7% Fokker-100, 21.3% Metro-II, 28.0% DC-9, and 14.0% Airbus A-320 (domestic flights); 69.6% Boeing and 30.4% Airbus (international flights) (Strategis, 2003).
- A default time-in-mode (TIM) was assumed for the different aircraft types (Radian, 1997; U.S. EPA, 1985).
- All aircraft were assumed to be twin-engine.
- Sulfur content of 0.035% by weight was used to determine the SO_x emission factor (PEMEX, 2003d).
- LTO data were not available for some airports in Coahuila, State of México, Nuevo León, Oaxaca, Quintana Roo, and Yucatan.
- No airports were identified in the states of Hidalgo or Tlaxcala.

SAMPLE CALCULATIONS:

Estimate the total annual VOC emissions from aircraft in Baja California.

State level Emissions:

LTO statistics: 25,712 incoming domestic flights and 3,739 incoming international flights

Domestic fleet flights: Fokker-100 = $0.367 \times 25,712 = 9,429$; Metro II = $0.213 \times 25,712 = 5,484$; DC-9 = $0.28 \times 25,712 = 7,199$; and Airbus = $0.14 \times 25,712 = 3,600$

International fleet flights: Boeing = $0.696 \times 3,739 = 2,601$; and Airbus = $0.304 \times 3,739 = 1,138$.

Annual VOC emissions = VOC emissions from domestic flights + VOC emissions from international flights.

VOC emissions from domestic flights = emissions from (Fokker-100 + Metro II + DC-9 + Airbus)

VOC emissions from Fokker-100 = take-off + climb out + approach + taxi/idle (in and out)

VOC emissions from Fokker-100 = TIM (min) × fuel flow (kg/min) × emission factor (kg/1,000 kg fuel) × number of flights × number of engines

VOC emissions from Fokker-100 = $((0.5 \times 45.6 \times 0.8/1,000) + (2.5 \times 37.8 \times 0.3/1,000) + (4.5 \times 13.8 \times 0.9/1,000) + (26.0 \times 6.6 \times 3.4/1,000)) \times 9,429$ flights × 2 engines = 12,934 kg = 12.9 Mg VOC

VOC emissions from domestic flights = 12.9 + 19.3 + 33.6 + 2.4 = 68.2 Mg

VOC emissions from international flights = emissions from (Boeing + Airbus) = 13.3 + 0.7 = 14.0 Mg

Annual VOC emissions = 68.2 + 14.0 = 82.2 Mg

Municipality level emissions – Mexicali:

VOC emissions from Fokker-100 = $((0.5 \times 45.6 \times 0.8/1,000) + (2.5 \times 37.8 \times 0.3/1,000) + (4.5 \times 13.8 \times 0.9/1,000) + (26.0 \times 6.6 \times 3.4/1,000)) \times (5,298 \times 0.3667)$ flights × 2 engines = 2,665.4 kg = 2.7 Mg

Total VOC emissions from domestic flights = 2.7 Mg + 4.0 Mg + 6.9 Mg + 0.5 Mg = 14.1 Mg

Total VOC emissions from international flights = 0.6 Mg + 11.4 Mg = 12.0 Mg

Total annual VOC emissions from domestic and international flights = 14.1 Mg + 12.0 Mg = 26.1 Mg

Aircraft							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	32.6	2.6	15.4	55.7	0.0	0.0
02	Baja California	173.4	13.7	82.2	296.3	0.0	0.0
03	Baja California Sur	157.7	12.1	71.4	262.6	0.0	0.0
04	Campeche	101.0	8.1	48.9	174.9	0.0	0.0
05	Coahuila	106.3	8.5	50.7	182.3	0.0	0.0
06	Colima	46.4	3.6	21.7	78.7	0.0	0.0
07	Chiapas	78.3	6.3	37.9	135.4	0.0	0.0
08	Chihuahua	161.8	12.7	76.0	275.1	0.0	0.0
09	Distrito Federal	921.2	72.0	428.8	1,558.5	0.0	0.0
10	Durango	47.2	3.8	22.8	81.5	0.0	0.0
11	Guanajuato	94.6	7.4	44.3	160.6	0.0	0.0
12	Guerrero	79.3	6.2	37.0	134.3	0.0	0.0
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco	534.5	41.6	247.1	900.6	0.0	0.0
15	México	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán	109.3	8.7	52.5	188.3	0.0	0.0
17	Morelos	31.5	2.5	15.3	54.6	0.0	0.0
18	Nayarit	30.7	2.5	14.9	53.2	0.0	0.0
19	Nuevo León	277.6	21.8	129.7	470.6	0.0	0.0
20	Oaxaca	28.3	2.3	13.6	48.8	0.0	0.0
21	Puebla	98.2	7.8	46.8	168.4	0.0	0.0
22	Querétaro	70.0	5.6	33.4	120.2	0.0	0.0
23	Quintana Roo	370.6	28.1	165.3	611.9	0.0	0.0
24	San Luis Potosí	84.9	6.8	40.5	145.7	0.0	0.0
25	Sinaloa	188.5	15.1	91.1	325.8	0.0	0.0
26	Sonora	210.5	16.6	99.1	358.5	0.0	0.0
27	Tabasco	36.3	2.9	17.6	63.0	0.0	0.0
28	Tamaulipas	142.7	11.3	68.0	244.7	0.0	0.0
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz	89.6	7.2	43.4	155.1	0.0	0.0
31	Yucatán	51.7	4.1	24.5	88.3	0.0	0.0
32	Zacatecas	17.7	1.4	8.3	30.1	0.0	0.0
National		4,372.4	343.3	2,048.2	7,423.7	0.0	0.0

Activity Data Rating: A

Emission Factor Rating: C

Overall Rating: C

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Commercial Marine Vessels

DESCRIPTION:

This source category includes emissions from commercial marine vessels powered either by diesel engines (distillate fuel) or steam turbines (residual fuel).

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- National-level marine distillate and residual fuel usage (ERG, 2003d; PEMEX, 2003a)
- Volume of cargo handled in commercial marine ports (INEGI, 2002a)

EMISSION FACTORS:

- NO_x – 6.52 kg/1000 liters (residual); 95.96 kg/1000 liters (distillate) (Billings et al., 2003; ERG, 2003e)
- SO_x – 28.20 kg/1000 liters (residual); 0.29 kg/1000 liters (distillate) (Billings et al., 2003; ERG, 2003e)
- VOC – 0.15 kg/1000 liters (residual); 0.84 kg/1000 liters (distillate) (Billings et al., 2003; ERG, 2003e)
- CO – 0.44 kg/1000 liters (residual); 9.46 kg/1000 liters (distillate) (Billings et al., 2003; ERG, 2003e)
- PM₁₀ – 3.09 kg/1000 liters (residual); 2.28 kg/1000 liters (distillate) (Billings et al., 2003; ERG, 2003e)
- PM_{2.5} – 3.02 kg/1000 liters (residual); 2.23 kg/1000 liters (distillate) (Billings et al., 2003; ERG, 2003e)

NOTES AND ASSUMPTIONS:

- Bulk terminal-weighted average sulfur content of distillate fuel was estimated to be 0.0399% by weight (PEMEX, 2003d).
- Bulk terminal-weighted average sulfur content of residual fuel was estimated to be 3.76% by weight (PEMEX, 2003d).
- Distillate density was assumed to be 0.845 kg/liter (U.S. EPA, 1995 [Appendix A]).
- Residual density was assumed to be 0.944 kg/liter (U.S. EPA, 1995 [Appendix A]).
- 25% of the residual fuel is assumed to be consumed by marine vessels at the port.
- 75% of the distillate fuel is assumed to be consumed by marine vessels at the port.
- PM₁₀ particle size distribution is assumed to be 96% of TSP (ARB, 2002).
- PM_{2.5} particle size distribution is assumed to be 97.6% of PM₁₀ (ARB, 2002).
- Commercial marine port cargo statistics were unavailable for Puerto Vallarta, Playa del Carmen, Minatitlan, and Nanchital.

SAMPLE CALCULATIONS:

Estimate annual NO_x emissions from commercial marines in Baja California.

National level marine distillate fuel usage = 899,412,619 liters/year
National level marine residual fuel usage = 76,077,808 liters/year

National level emissions from commercial marine fuel usage:

Distillate fuel used in the ports = $0.75 \times 899,412,619$ liters/year = 674,559,464 liters/year
Residual fuel used in the ports = $0.25 \times 76,077,808$ liters/year = 19,019,452 liters/year

Annual NO_x emissions = $[95.96 \text{ kg/1000 liters} \times (674,559,464 \text{ liters})] + [6.52 \text{ kg/1000 liters} \times (19,019,452 \text{ liters})]$
= 64,854,733 kg = 64,854.7 Mg

State Level Emissions - Baja California:

Volume of cargo in ports located in Baja California = 17,668,000 Mg/yr
National volume of cargo handled = 231,440,000 Mg/yr

Annual NO_x emissions in Baja California = $(17,668,000/231,440,000) \times 64,854.7 \text{ Mg} = 4,951.2 \text{ Mg}$

Municipality Level Emissions – Playas de Rosarito:

Volume of cargo handled in ports located in Playas de Rosarito = 2,828,000 Mg/yr

Annual NO_x emissions in Playas de Rosarito = $(2,828,000/17,668,000) \times 4,951.2 \text{ Mg} = 792.5 \text{ Mg}$

Commercial Marine Vessels							
State Code	State Name	Annual Emissions (Mg/yr)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	0.0
02	Baja California	5,809.1	68.9	51.1	572.3	142.5	139.1
03	Baja California Sur	4,339.1	51.5	38.2	427.5	106.4	103.9
04	Campeche	13,331.2	158.1	117.3	1,313.3	327.0	319.2
05	Coahuila	0.0	0.0	0.0	0.0	0.0	0.0
06	Colima	3,349.4	39.7	29.5	330.0	82.2	80.2
07	Chiapas	1.3	0.0	0.0	0.1	0.0	0.0
08	Chihuahua	0.0	0.0	0.0	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	0.0	0.0	0.0	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	0.0
12	Guerrero	172.6	2.0	1.5	17.0	4.2	4.1
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco [*]	0.0	0.0	0.0	0.0	0.0	0.0
15	México	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán	5,739.1	68.1	50.5	565.4	140.8	137.4
17	Morelos	0.0	0.0	0.0	0.0	0.0	0.0
18	Nayarit [*]	0.0	0.0	0.0	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	0.0	0.0	0.0	0.0
20	Oaxaca	5,831.8	69.2	51.3	574.5	143.0	139.6
21	Puebla	0.0	0.0	0.0	0.0	0.0	0.0
22	Querétaro	0.0	0.0	0.0	0.0	0.0	0.0
23	Quintana Roo	2,624.4	31.1	23.1	258.5	64.4	62.8
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	0.0
25	Sinaloa	1,816.9	21.5	16.0	179.0	44.6	43.5
26	Sonora	1,393.1	16.5	12.3	137.2	34.2	33.4
27	Tabasco	6,627.1	78.6	58.3	652.9	162.6	158.7
28	Tamaulipas	4,397.9	52.2	38.7	433.3	107.9	105.3
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz	19,666.1	233.2	173.0	1,937.4	482.4	470.8
31	Yucatán	996.6	11.8	8.8	98.2	24.4	23.9
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	0.0
National		76,095.7	902.4	669.6	7,496.6	1,866.6	1,821.9
							0.0

Activity Data Rating: B

Emission Factor Rating: C

Overall Rating: C

Date: April 6, 2005

* No emissions were estimated for the states of Jalisco and Nayarit as no commercial cargo data was available for ports in these states.

SOURCE TYPE: Area SOURCE CATEGORY: Border Crossings

DESCRIPTION:

Emissions from motor vehicles idling at border crossings.

POLLUTANTS:

NO_x, VOC, and CO

METHOD:

Emission factors derived from MOBILE5-JuárezII, Version 5a.1 (ERG, 2002b)

ACTIVITY DATA:

- Monthly average minimum and maximum temperatures (NCDC, 2003)
- Altitude of the border crossing
- Number of vehicles at border crossing points (BTS, 1999)
- Vehicle wait times at various border crossing ports (CBP, 2003)

EMISSION FACTORS:

- MOBILE5-JuárezII (ERG, 2002b)

NOTES AND ASSUMPTIONS:

- Average vehicle speed at border crossing points is assumed to be 4 km/hr.
- Passenger vehicles were considered as light-duty gasoline vehicles (LDGV).
- Trucks and buses were grouped as heavy-duty diesel vehicles (HDDV).
- Emissions were only estimated for vehicles entering from Mexico into the United States.
- Emissions were not estimated at the Mexico-Guatemala or Mexico-Belize borders.
- There are no border crossings in the state of Nuevo León.

SAMPLE CALCULATIONS:

Estimate NO_x emissions from border crossings in Baja California.

Total emissions from border crossings in Baja California = emissions from Tijuana, Mexicali, and Tecate

Municipality level emissions – Mexicali:

NO_x emission factors for LDGV in the month of January = 3.04 g/km

Number of LDGV in January = 823,705

Average wait time for passenger vehicles = 21 minutes = 0.35 hr

NO_x emissions = $3.04 \text{ g/km} \times 823,705 \times 4 \text{ km/hr} \times 0.35 \text{ hr} = 3.5 \text{ Mg}$

NO_x emission factors for HDDV in the month of January = 18.05 g/km

Number of HDDV in January = 20,131

Average wait time for commercial vehicles = 4 minutes = 0.07 hr

NO_x emissions = $18.05 \text{ g/km} \times 20,131 \times 4 \text{ km/hr} \times 0.07 \text{ hr} = 0.1 \text{ Mg}$

Total annual emissions at the Mexicali border crossing = Σ (Emissions in each month)

Total annual NO_x emissions at the Mexicali border crossing = 39.0 Mg

State level emissions:

Total annual NO_x emissions in Baja California = NO_x emissions at Mexicali border crossing + NO_x emissions at Tijuana border crossing + NO_x emissions at Tecate border crossing

Total annual NO_x emissions at the Mexicali border crossing = 39.0 Mg

Total annual NO_x emissions at the Tecate border crossing = 4.0 Mg

Total annual NO_x emissions at the Tijuana border crossing = 78.8 Mg

Total annual NO_x emissions in Baja California from border crossings = $78.8 \text{ Mg} + 39.0 \text{ Mg} + 4.0 \text{ Mg} = 121.8 \text{ Mg}$

Border Crossings							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	0.0
02	Baja California	121.8	0.0	871.3	9,269.1	0.0	0.0
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	0.0	0.0	0.0	0.0
05	Coahuila	9.3	0.0	62.9	674.1	0.0	0.0
06	Colima	0.0	0.0	0.0	0.0	0.0	0.0
07	Chiapas	0.0	0.0	0.0	0.0	0.0	0.0
08	Chihuahua	47.4	0.0	312.3	3,581.9	0.0	0.0
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	0.0	0.0	0.0	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	0.0
12	Guerrero	0.0	0.0	0.0	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	0.0
14	Jalisco	0.0	0.0	0.0	0.0	0.0	0.0
15	México	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán	0.0	0.0	0.0	0.0	0.0	0.0
17	Morelos	0.0	0.0	0.0	0.0	0.0	0.0
18	Nayarit	0.0	0.0	0.0	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	0.0	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	0.0	0.0	0.0	0.0
21	Puebla	0.0	0.0	0.0	0.0	0.0	0.0
22	Querétaro	0.0	0.0	0.0	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	0.0	0.0	0.0	0.0
26	Sonora	44.6	0.0	286.6	3,134.1	0.0	0.0
27	Tabasco	0.0	0.0	0.0	0.0	0.0	0.0
28	Tamaulipas	116.6	0.0	465.1	4,920.3	0.0	0.0
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz	0.0	0.0	0.0	0.0	0.0	0.0
31	Yucatán	0.0	0.0	0.0	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	0.0
National		339.7	0.0	1,998.2	21,579.5	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: B

Overall Rating: B

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Gasoline Distribution

DESCRIPTION:

This source category relates to the emissions occurring during the transportation and distribution of gasoline. This category includes tank truck loading emissions at bulk terminals, tank truck transit losses, Stage I loading losses (from tank truck to underground tank), tank breathing, and Stage II loading losses (from underground tank to vehicle – including spillage).

POLLUTANTS:

VOC

METHOD:

Emission factors

ACTIVITY DATA:

- Gasoline quantity used in each state (PEMEX, 2003a; ERG, 2003d)
- Municipality level gas station information including controls (PEMEX, 2003e)

EMISSION FACTORS:

- VOC_{Bulk terminal} – 1,430 mg/liter; VOC_{Gas filled trucks} – 1 mg/liter; VOC_{Vapor filled trucks} – 13 mg/liter; VOC_{Stage I controlled} – 40 mg/liter; VOC_{Stage I uncontrolled} – 1,380 mg/liter; VOC_{Tank losses} – 120 mg/liter, VOC_{Stage II controlled} – 132 mg/liter; VOC_{Stage II uncontrolled} – 1320 mg/liter and VOC_{Spillage} – 80 mg/liter (EIIP, 2001b)

NOTES AND ASSUMPTIONS:

- Splash filling was employed for tank truck filling at bulk terminals.
- Tank truck transit emissions were allocated to municipalities based on the population in those municipalities with gas stations.

SAMPLE CALCULATIONS:

Estimate annual VOC emissions from gasoline distribution in Baja California.

Annual emissions from gasoline distribution at gas stations in Baja California = Emissions from (Ensenada + Mexicali + Tecate + Tijuana + Rosarito).

National level quantity of gasoline = 29,639,056,250 liters/year

Emissions in Ensenada:

Number of gas stations in Ensenada = 44; Gas stations with stage I controls = 3; Gas stations with stage II controls = 0; Population of Ensenada = 370,730; Total population of all municipalities with gas stations = 87,821,605

Quantity of gasoline from Ensenada bulk terminal = 237,568,126 liters/year

Quantity of gasoline from Ensenada stations = $(370,730/87,821,605) \times 29,639,056,250$ liters = 125,118,270 liters/year

Tank truck filling emissions at bulk terminal = 237,568,126 liters $\times 1,430 \text{ mg/liter}/10^9$ = 339.7 Mg

Tank truck transit emissions = 125,118,270 $\times (1 \text{ mg/liter} + 13 \text{ mg/liter})/10^9$ = 1.8 Mg

Stage I emissions = 125,118,270 liters $\times ([3/44 \times 40 \text{ mg/liter}] + [41/44 \times 1,380 \text{ mg/liter}])/10^9$ = 161.2 Mg

Stage II emissions (including spillage) = 125,118,270 liters $\times (1,320 \text{ mg/liter} + 80 \text{ mg/liter})/10^9$ = 175.2 Mg

Underground tank emissions = 125,118,270 liters $\times 120 \text{ mg/liter}/10^9$ = 15.0 Mg

Total Ensenada gasoline distribution emissions = 339.7 Mg + 1.8 Mg + 161.2 Mg + 175.2 Mg + 15.0 Mg = 692.9 Mg

Total emissions from gasoline distribution at gas stations in Baja California = 692.9 Mg (Ensenada) + 1,240.5 Mg (Mexicali) + 41.3 Mg (Tecate) + 643.2 Mg (Tijuana) + 1,105.9 Mg (Rosarito) = 3,723.8 Mg

Gasoline Distribution							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	1,144.2	0.0	0.0	0.0
02	Baja California	0.0	0.0	3,723.8	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	808.2	0.0	0.0	0.0
04	Campeche	0.0	0.0	855.9	0.0	0.0	0.0
05	Coahuila	0.0	0.0	2,403.7	0.0	0.0	0.0
06	Colima	0.0	0.0	809.2	0.0	0.0	0.0
07	Chiapas	0.0	0.0	3,546.5	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	3,484.8	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	8,656.3	0.0	0.0	0.0
10	Durango	0.0	0.0	2,145.1	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	4,977.5	0.0	0.0	0.0
12	Guerrero	0.0	0.0	3,070.5	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	1,972.2	0.0	0.0	0.0
14	Jalisco	0.0	0.0	6,205.3	0.0	0.0	0.0
15	México	0.0	0.0	6,120.7	0.0	0.0	0.0
16	Michoacán	0.0	0.0	3,893.8	0.0	0.0	0.0
17	Morelos	0.0	0.0	1,746.5	0.0	0.0	0.0
18	Nayarit	0.0	0.0	850.2	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	4,478.0	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	2,039.6	0.0	0.0	0.0
21	Puebla	0.0	0.0	4,105.4	0.0	0.0	0.0
22	Querétaro	0.0	0.0	1,770.6	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	577.8	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	1,872.1	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	2,969.5	0.0	0.0	0.0
26	Sonora	0.0	0.0	2,659.7	0.0	0.0	0.0
27	Tabasco	0.0	0.0	1,370.5	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	3,309.7	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	374.2	0.0	0.0	0.0
30	Veracruz	0.0	0.0	6,740.2	0.0	0.0	0.0
31	Yucatán	0.0	0.0	1,701.4	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	1,176.3	0.0	0.0	0.0
National		0.0	0.0	91,559.4	0.0	0.0	0.0

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: LPG Distribution

DESCRIPTION:

This source category includes emissions due to leaks and evaporative losses from LPG transport, storage, and distribution systems within the industrial, commercial, residential, agricultural, and transportation sectors.

POLLUTANTS:

VOC

METHOD:

Emission factor

ACTIVITY DATA:

State level LPG usage (ERG, 2003d; PEMEX, 2003b; SENER, 2000a; SENER, 2000b; SENER, 2001b; SENER, 2002b)

EMISSION FACTORS:

- LPG leakage emission factor – 3.6% of total LPG (PEMEX, 1997; Radian, 1997)

ASSUMPTIONS:

- LPG density was assumed to be 0.507 kg/liter (U.S. EPA, 1995 [Appendix A]).
- VOC emissions are 98.4% of TOG emissions (Radian, 1997).
- LPG transport, storage, and distribution practices throughout the entire country of Mexico are similar to those in Mexico City.

SAMPLE CALCULATIONS:

Estimate emissions from LPG distribution in Baja California.

State level emissions:

Annual LPG usage in Baja California = 601,026,177 liters

LPG density = 0.507 kg/liter

Sector fractions: industrial = 0.04400; commercial/transportation = 0.25698; agricultural = 0.00300; and residential = 0.69602

Annual VOC emissions in Baja California = $601,026,177 \times 0.507 \times 0.036 \times 0.984 = 10,794,411 \text{ kg} = 10,794.4 \text{ Mg}$

Municipality level emissions – Mexicali:

Annual VOC emissions from state wide industrial LPG distribution = $10,794.4 \text{ Mg} \times 0.04400 = 475.0 \text{ Mg}$

Ratio of municipality level industrial employees to state industrial employee = $61,822/249,176$

Annual VOC emissions in Mexicali = $(61,822/249,176) \times 475 \text{ Mg} = 117.8 \text{ Mg}$

Annual VOC emissions from state wide commercial/transportation LPG distribution = $10,794.4 \text{ Mg} \times 0.25698 = 2,773.9 \text{ Mg}$

Ratio of municipality level commercial employees to state level commercial employee = $70,826/258,796$

Annual VOC emissions in Mexicali = $(70,826/258,796) \times 2,773.9 \text{ Mg} = 759.1 \text{ Mg}$

Annual VOC emissions from state wide agricultural LPG distribution = $10,794.4 \text{ Mg} \times 0.00300 = 32.4 \text{ Mg}$

Ratio of municipality level agricultural employees to state level agricultural employees = $731/4,513$

Annual VOC emissions in Mexicali = $(731/4,513) \times 32.4 \text{ Mg} = 5.2 \text{ Mg}$

Annual VOC emissions from state wide residential LPG distribution = $10,794.4 \text{ Mg} \times 0.69602 = 7,513.1 \text{ Mg}$

Ratio of municipality level households to state level households = $190,426/610,057$

Annual VOC emissions in Mexicali = $(190,426/610,057) \times 7,513.1 \text{ Mg} = 2,345.2 \text{ Mg}$

Total annual emissions in Mexicali from LPG distribution = $117.8 \text{ Mg} + 759.1 \text{ Mg} + 5.2 \text{ Mg} + 2,345.2 \text{ Mg} = 3,227.3 \text{ Mg}$

LPG Distribution							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	4,828.9	0.0	0.0	0.0
02	Baja California	0.0	0.0	10,794.4	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	1,364.1	0.0	0.0	0.0
04	Campeche	0.0	0.0	980.7	0.0	0.0	0.0
05	Coahuila	0.0	0.0	13,264.3	0.0	0.0	0.0
06	Colima	0.0	0.0	1,748.0	0.0	0.0	0.0
07	Chiapas	0.0	0.0	7,343.2	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	15,273.3	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	19,936.6	0.0	0.0	0.0
10	Durango	0.0	0.0	3,453.9	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	15,307.8	0.0	0.0	0.0
12	Guerrero	0.0	0.0	4,920.3	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	6,549.5	0.0	0.0	0.0
14	Jalisco	0.0	0.0	24,086.6	0.0	0.0	0.0
15	México	0.0	0.0	72,348.1	0.0	0.0	0.0
16	Michoacán	0.0	0.0	12,486.3	0.0	0.0	0.0
17	Morelos	0.0	0.0	6,514.5	0.0	0.0	0.0
18	Nayarit	0.0	0.0	2,482.7	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	11,139.7	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	4,059.0	0.0	0.0	0.0
21	Puebla	0.0	0.0	15,132.3	0.0	0.0	0.0
22	Querétaro	0.0	0.0	5,202.3	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	2,067.7	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	6,185.1	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	8,008.9	0.0	0.0	0.0
26	Sonora	0.0	0.0	10,465.8	0.0	0.0	0.0
27	Tabasco	0.0	0.0	3,994.4	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	9,711.7	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	5,638.3	0.0	0.0	0.0
30	Veracruz	0.0	0.0	16,826.9	0.0	0.0	0.0
31	Yucatán	0.0	0.0	3,106.8	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	6,877.3	0.0	0.0	0.0
National		0.0	0.0	332,099.4	0.0	0.0	0.0

Activity Data Rating: A

Emission Factor Rating: B

Overall Rating: B

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Industrial Surface Coating

DESCRIPTION:

Source category includes coatings such as paints, varnish, lacquer, and paint primer. Surface coatings are applied to a wide variety of products, including furniture, cans, automobiles, airplanes and other transportation equipment, machinery, household appliances, flat wood, wire, and other miscellaneous products. In addition, coatings are used in maintenance operations at industrial facilities.

POLLUTANTS:

VOC

METHOD:

Per employee emission factors derived from Mexico paint sales.

ACTIVITY DATA:

Employee data (INEGI, 1999a)

EMISSION FACTORS:

- Per employee emission factors for different industrial sectors (kg/employee-year):

Wood furniture – 111.37	Automotive industry – 170.64
Metal furniture – 133.79	Other transportation equipment – 116.42
Other metallic products – 102.12	Other manufacturing industries – 155.50
Electrical & electronic equipment – 1.51	Industrial maintenance & surface coatings – 6.34

NOTES AND ASSUMPTIONS:

- Solvent-based paint is assumed to contain 450 g VOC/liter of paint (ANAFAPYT, 2003).
- The paint sales data provided by ANAFAPYT accounted for 90% of paint sales in Mexico; these data were extrapolated to 100%.
- Employee data used for the following industrial sectors (with CMAP codes):
 - Wood furniture – 3320 Repair and manufacturing of wooden furniture;
 - Metal furniture – 3813 Manufacturing and repair of metallic furniture;
 - Other metallic products – 3814 Manufacturing of other metallic products, excluding machinery/equipment;
 - Electrical and electronic equipment –
 - 3831 Manufacturing and/or assembly of machinery, equipment and other electrical accessories,
 - 3832 Manufacturing and/or assembly of electronic, radio, TV, communication and medical equipment;
 - Automotive industry – 3841 Automotive industry;
 - Other transportation equipment – 3842 Manufacturing, repair and/or assembly of transportation equipment and parts, excl. cars and trucks;
 - Other manufacturing industries – 39 Other manufacturing industries; and
 - Industrial maintenance and surface coatings – 3 Manufacturing industries.

SAMPLE CALCULATIONS:

Estimate the total annual VOC emissions from industrial surface coating in Baja California.

State level emissions:

Employee data:

Wood furniture – 15,259; Metal furniture – 3,218; Other metallic products – 13,389; Electrical & electronic equip. – 76,079; Automotive industry – 6,494; Other transportation equipment – 4,208; Other manufacturing industries – 12,569; Industrial maintenance & surface coatings – 248,458

$$\begin{aligned} \text{Annual VOC emissions} = & (15,259 \times 111.37) + (3,218 \times 133.79) + (13,389 \times 102.12) + (76,079 \times 1.51) + (6,494 \times 170.64) \\ & + (4,208 \times 116.42) + (12,569 \times 155.50) + (248,458 \times 6.34) = 8,740,982 \text{ kg} = 8,741.0 \text{ Mg} \end{aligned}$$

Municipality level emissions – Mexicali:

$$\begin{aligned} \text{Annual VOC emissions} = & (359 \times 111.37) + (823 \times 133.79) + (4,940 \times 102.12) + (15,778 \times 1.51) + (2,984 \times 170.64) \\ & + (3,763 \times 116.42) + (4,394 \times 155.50) + (61,375 \times 6.34) = 2,698,330 \text{ kg} = 2,698.3 \text{ Mg} \end{aligned}$$

Industrial Surface Coating							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	2,547.6	0.0	0.0	0.0
02	Baja California	0.0	0.0	8,741.0	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	112.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	111.0	0.0	0.0	0.0
05	Coahuila	0.0	0.0	5,706.9	0.0	0.0	0.0
06	Colima	0.0	0.0	139.6	0.0	0.0	0.0
07	Chiapas	0.0	0.0	612.9	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	6,719.8	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	12,278.4	0.0	0.0	0.0
10	Durango	0.0	0.0	1,295.0	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	3,678.4	0.0	0.0	0.0
12	Guerrero	0.0	0.0	1,244.7	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	1,379.2	0.0	0.0	0.0
14	Jalisco	0.0	0.0	7,966.6	0.0	0.0	0.0
15	México	0.0	0.0	15,984.6	0.0	0.0	0.0
16	Michoacán	0.0	0.0	1,742.3	0.0	0.0	0.0
17	Morelos	0.0	0.0	978.7	0.0	0.0	0.0
18	Nayarit	0.0	0.0	156.4	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	9,117.8	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	906.7	0.0	0.0	0.0
21	Puebla	0.0	0.0	6,966.4	0.0	0.0	0.0
22	Querétaro	0.0	0.0	2,514.5	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	168.9	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	2,009.9	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	615.1	0.0	0.0	0.0
26	Sonora	0.0	0.0	2,586.4	0.0	0.0	0.0
27	Tabasco	0.0	0.0	292.0	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	4,287.5	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	820.2	0.0	0.0	0.0
30	Veracruz	0.0	0.0	1,602.8	0.0	0.0	0.0
31	Yucatán	0.0	0.0	921.4	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	313.6	0.0	0.0	0.0
National		0.0	0.0	104,518.3	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: B

Overall Rating: B

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Solvent Cleaning/Degreasing

DESCRIPTION:

Volatile organic compound emissions from surface cleaning operations. Surface cleaning operations involve the use of solvent liquids or solvent vapors to remove water-insoluble contaminants such as grease, oils, waxes, carbon deposits, fluxes, and tars from metal, plastic, glass, and other surfaces.

POLLUTANTS:

VOC

METHOD:

Per employee emission factors

ACTIVITY DATA:

- Municipality level employee statistics for the industrial manufacturing sector (CMAP 31-39) (INEGI, 1999a)

EMISSION FACTORS:

- Per employee emission factor – 39.46 kg/employee-year (EIIP, 1997)

NOTES AND ASSUMPTIONS:

- It is assumed that Mexican solvent cleaning and degreasing operations are similar to those in the U.S.

SAMPLE CALCULATIONS:

Estimate the total annual emissions from degreasing operations in Baja California.

State Level Emissions – Baja California:

Number of employees in manufacturing industries in Baja California = 248,458
Per employee VOC emission factor = 39.46 kg/employee/year

Annual VOC emissions = $248,458 \times 39.46 \text{ kg/employee/yr} = 9,803,105 \text{ kg} = 9,803.1 \text{ Mg}$

Municipality Level Emissions – Mexicali:

Number of employees in manufacturing industries in Mexicali = 61,375
Per employee VOC emission factor = 39.46 kg/employee/yr

Annual VOC emissions = $61,375 \times 39.46 \text{ kg/employee/yr} = 2,421,599 \text{ kg} = 2,421.6 \text{ Mg}$

Solvent Cleaning/Degreasing							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	2,761.2	0.0	0.0	0.0
02	Baja California	0.0	0.0	9,803.1	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	462.8	0.0	0.0	0.0
04	Campeche	0.0	0.0	337.2	0.0	0.0	0.0
05	Coahuila	0.0	0.0	7,530.9	0.0	0.0	0.0
06	Colima	0.0	0.0	373.0	0.0	0.0	0.0
07	Chiapas	0.0	0.0	1,197.2	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	13,945.3	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	19,651.1	0.0	0.0	0.0
10	Durango	0.0	0.0	2,741.4	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	9,138.2	0.0	0.0	0.0
12	Guerrero	0.0	0.0	1,445.5	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	2,897.8	0.0	0.0	0.0
14	Jalisco	0.0	0.0	12,847.4	0.0	0.0	0.0
15	México	0.0	0.0	19,312.4	0.0	0.0	0.0
16	Michoacán	0.0	0.0	3,249.9	0.0	0.0	0.0
17	Morelos	0.0	0.0	1,618.0	0.0	0.0	0.0
18	Nayarit	0.0	0.0	485.9	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	12,777.3	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	2,058.6	0.0	0.0	0.0
21	Puebla	0.0	0.0	8,885.0	0.0	0.0	0.0
22	Querétaro	0.0	0.0	3,610.7	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	369.5	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	2,935.0	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	1,581.9	0.0	0.0	0.0
26	Sonora	0.0	0.0	5,434.0	0.0	0.0	0.0
27	Tabasco	0.0	0.0	826.2	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	7,519.2	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	2,232.6	0.0	0.0	0.0
30	Veracruz	0.0	0.0	5,240.1	0.0	0.0	0.0
31	Yucatán	0.0	0.0	2,759.4	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	991.8	0.0	0.0	0.0
National		0.0	0.0	167,019.6	0.0	0.0	0.0

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Architectural Surface Coating

DESCRIPTION:

Surface coatings such as paints, paint primer, varnish, or lacquer applied to architectural surfaces.

POLLUTANTS:

VOC

METHOD:

Per capita emission factors derived from Mexico paint sales.

ACTIVITY DATA:

Population (INEGI, 2000a)

EMISSION FACTORS:

- Per capita emission factor calculated from paint sales data – 0.507 kg/person-year (ANAFAPYT, 2003)

NOTES AND ASSUMPTIONS:

- Solvent-based paint is assumed to contain 450 g VOC/liter of paint (ANAFAPYT, 2003).
- Water-based paint is assumed to contain 88.7 g VOC/liter of paint (EIIP, 1995).
- The paint sales data provided by ANAFAPYT accounted for 90% of paint sales in Mexico (ANAFAPYT, 2003); these data were extrapolated to 100%.

SAMPLE CALCULATIONS:

Estimate the total annual VOC emissions from architectural surface coatings in Baja California.

State level emissions:

Population of Baja California = 2,487,367

Per capita VOC emission factor = 0.5073 kg/person/year

Annual VOC emissions = $2,487,367 \times 0.5073 = 1,261,841 \text{ kg} = 1,261.8 \text{ Mg}$

Municipality level emissions – Mexicali:

Population of Mexicali = 764,602

Per capita VOC emission factor = 0.5073 kg/person/year

Annual VOC emissions = $764,602 \times 0.5073 = 387,883 \text{ kg} = 387.9 \text{ Mg}$

Architectural Surface Coatings							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	479.0	0.0	0.0	0.0
02	Baja California	0.0	0.0	1,261.9	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	215.1	0.0	0.0	0.0
04	Campeche	0.0	0.0	350.4	0.0	0.0	0.0
05	Coahuila	0.0	0.0	1,165.8	0.0	0.0	0.0
06	Colima	0.0	0.0	275.3	0.0	0.0	0.0
07	Chiapas	0.0	0.0	1,989.1	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	1,548.8	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	4,365.5	0.0	0.0	0.0
10	Durango	0.0	0.0	734.9	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	2,365.6	0.0	0.0	0.0
12	Guerrero	0.0	0.0	1,562.3	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	1,134.1	0.0	0.0	0.0
14	Jalisco	0.0	0.0	3,207.2	0.0	0.0	0.0
15	México	0.0	0.0	6,644.0	0.0	0.0	0.0
16	Michoacán	0.0	0.0	2,021.9	0.0	0.0	0.0
17	Morelos	0.0	0.0	789.0	0.0	0.0	0.0
18	Nayarit	0.0	0.0	466.8	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	1,945.1	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	1,744.5	0.0	0.0	0.0
21	Puebla	0.0	0.0	2,575.4	0.0	0.0	0.0
22	Querétaro	0.0	0.0	712.4	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	443.9	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	1,166.5	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	1,287.0	0.0	0.0	0.0
26	Sonora	0.0	0.0	1,124.7	0.0	0.0	0.0
27	Tabasco	0.0	0.0	959.7	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	1,396.7	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	488.4	0.0	0.0	0.0
30	Veracruz	0.0	0.0	3,505.0	0.0	0.0	0.0
31	Yucatán	0.0	0.0	841.2	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	686.7	0.0	0.0	0.0
National		0.0	0.0	49,453.9	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: B

Overall Rating: B

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Autobody Refinishing

DESCRIPTION:

Repair and restoration of automobiles, light trucks, and other vehicle bodies. Most repair jobs include refinishing on a portion of the vehicle; new vehicle coating is excluded from this source category.

POLLUTANTS:

VOC

METHOD:

Per employee emission factors derived from Mexico paint sales.

ACTIVITY DATA:

Employee data (INEGI, 1999a)

EMISSION FACTORS:

- Per employee emission factor calculated from paint sales data – 125.76 kg/employee-year (ANAFAPYT, 2003)

NOTES AND ASSUMPTIONS:

- Solvent-based paint is assumed to contain 450 g VOC/liter of paint (ANAFAPYT, 2003).
- Paint sales data provided by ANAFAPYT accounted for 90% of paint sales in Mexico, this data was extrapolated to 100%.
- Overall thinner and solvent use allocated to specific categories based upon relative paint quantities.
- Employee data used for the automotive industry sector (CMAP code 3841) (INEGI, 1999a).

SAMPLE CALCULATIONS:

Estimate the total annual VOC emissions from autobody refinishing in Baja California.

State level emissions:

Number of employees in the automotive industry sector = 6,494

Per employee VOC emission factor = 125.76 kg/employee/year

Annual VOC emissions = $6,494 \times 125.76 = 816,685 \text{ kg} = 816.7 \text{ Mg}$

Municipality level emissions – Mexicali:

Number of employees in Mexicali in the automotive industry sector = 2,984

Per employee VOC emission factor = 125.76 kg/employee/year

Annual VOC emissions = $2,984 \times 125.76 = 375,268 \text{ kg} = 375.3 \text{ Mg}$

Autobody Refinishing							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	999.3	0.0	0.0	0.0
02	Baja California	0.0	0.0	816.7	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	0.1	0.0	0.0	0.0
04	Campeche	0.0	0.0	0.8	0.0	0.0	0.0
05	Coahuila	0.0	0.0	2,189.8	0.0	0.0	0.0
06	Colima	0.0	0.0	2.4	0.0	0.0	0.0
07	Chiapas	0.0	0.0	13.8	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	1,492.5	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	1,597.8	0.0	0.0	0.0
10	Durango	0.0	0.0	135.4	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	960.3	0.0	0.0	0.0
12	Guerrero	0.0	0.0	4.3	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	301.6	0.0	0.0	0.0
14	Jalisco	0.0	0.0	901.8	0.0	0.0	0.0
15	México	0.0	0.0	4,944.3	0.0	0.0	0.0
16	Michoacán	0.0	0.0	26.3	0.0	0.0	0.0
17	Morelos	0.0	0.0	341.7	0.0	0.0	0.0
18	Nayarit	0.0	0.0	4.5	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	1,902.6	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	31.7	0.0	0.0	0.0
21	Puebla	0.0	0.0	3,004.2	0.0	0.0	0.0
22	Querétaro	0.0	0.0	977.2	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	4.3	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	522.9	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	9.9	0.0	0.0	0.0
26	Sonora	0.0	0.0	459.8	0.0	0.0	0.0
27	Tabasco	0.0	0.0	5.3	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	1,606.0	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	184.2	0.0	0.0	0.0
30	Veracruz	0.0	0.0	39.0	0.0	0.0	0.0
31	Yucatán	0.0	0.0	11.6	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	0.0
National		0.0	0.0	23,492.1	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: B

Overall Rating: B

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Consumer Solvents

DESCRIPTION:

Personal care products (i.e., perfumes, hair sprays, etc.), automotive use products (i.e., windshield fluid, wax, glass cleaner, etc.), household cleaning products, adhesives, sealants, household pesticides, etc.

POLLUTANTS:

VOC

METHOD:

Per capita emission factors

ACTIVITY DATA:

- Population (INEGI, 2000a)

EMISSION FACTORS:

- Per capita emission factor – 3.556 kg/person-year (converted from 7.84 lbs/person-year) (EIIP, 1996a)

NOTES AND ASSUMPTIONS:

- It is assumed that Mexico per capita consumer solvent use is identical to U.S. per capita consumer solvent use.

SAMPLE CALCULATIONS:

Estimate the total annual emissions from consumer solvent usage in Baja California.

State Level Emissions – Baja California:

Population of Baja California = 2,487,367

Per capita VOC emission factor = 3.556 kg/person/year

Annual VOC emissions = $2,487,367 \times 3.556 \text{ kg/person/yr} = 8,843,972 \text{ kg} = 8,844.0 \text{ Mg}$

Municipality Level Emissions – Mexicali:

Population of Mexicali = 764,602

Per capita VOC emission factor = 3.556 kg/person/yr

Annual VOC emissions = $764,602 \times 3.556 \text{ kg/person/yr} = 2,718,585 \text{ kg} = 2,718.6 \text{ Mg}$

Consumer Solvents							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	3,357.5	0.0	0.0	0.0
02	Baja California	0.0	0.0	8,844.0	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	1,507.7	0.0	0.0	0.0
04	Campeche	0.0	0.0	2,455.8	0.0	0.0	0.0
05	Coahuila	0.0	0.0	8,170.9	0.0	0.0	0.0
06	Colima	0.0	0.0	1,929.3	0.0	0.0	0.0
07	Chiapas	0.0	0.0	13,940.9	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	10,854.8	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	30,596.4	0.0	0.0	0.0
10	Durango	0.0	0.0	5,150.8	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	16,579.7	0.0	0.0	0.0
12	Guerrero	0.0	0.0	10,949.9	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	7,948.8	0.0	0.0	0.0
14	Jalisco	0.0	0.0	22,478.2	0.0	0.0	0.0
15	México	0.0	0.0	46,566.0	0.0	0.0	0.0
16	Michoacán	0.0	0.0	14,171.3	0.0	0.0	0.0
17	Morelos	0.0	0.0	5,529.9	0.0	0.0	0.0
18	Nayarit	0.0	0.0	3,271.8	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	13,632.5	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	12,226.7	0.0	0.0	0.0
21	Puebla	0.0	0.0	18,050.4	0.0	0.0	0.0
22	Querétaro	0.0	0.0	4,993.1	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	3,111.0	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	8,175.5	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	9,019.9	0.0	0.0	0.0
26	Sonora	0.0	0.0	7,882.6	0.0	0.0	0.0
27	Tabasco	0.0	0.0	6,726.5	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	9,789.2	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	3,422.7	0.0	0.0	0.0
30	Veracruz	0.0	0.0	24,565.2	0.0	0.0	0.0
31	Yucatán	0.0	0.0	5,895.9	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	4,812.8	0.0	0.0	0.0
National		0.0	0.0	346,607.7	0.0	0.0	0.0

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Dry Cleaning

DESCRIPTION:

Solvent evaporation during dry cleaning process, from leaks in the equipment, and from solvent recovery or disposal systems. Only dry cleaning facilities using petroleum distillate organic solvents for cleaning are included in this category.

POLLUTANTS:

VOC

METHOD:

Employee statistics and per employee emission factors.

ACTIVITY DATA:

- Employee data (INEGI, 1999a)

EMISSION FACTORS:

- Per employee emission factor calculated from solvent use statistics – 317.76 kg/employee-year (CANALAVA, 2002)

NOTES AND ASSUMPTIONS:

- Specific gravity of the petroleum solvent used is assumed to be 0.667 kg/liter at 60 °F.
- Employee data used for the dry cleaning sector (CMAP code 9530) (INEGI, 1999a).

SAMPLE CALCULATIONS:

Estimate the total annual VOC emissions from dry cleaning in Baja California.

State level emissions:

Number of employees in the dry cleaning sector = 1,683
Per employee VOC emission factor = 317.76 kg/employee/year

Annual VOC emissions = $1,683 \times 317.76 = 534,790.1$ kg = 534.8 Mg

Municipality level emissions – Mexicali:

Number of employees in Mexicali in the dry cleaning sector = 412
Per employee VOC emissions factor = 317.76 kg/employee/year

Annual VOC emissions = $412 \times 317.76 = 130,917.1$ kg = 130.9 Mg

Dry Cleaning							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	926.0	0.0	0.0	0.0
02	Baja California	0.0	0.0	534.8	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	70.5	0.0	0.0	0.0
04	Campeche	0.0	0.0	24.5	0.0	0.0	0.0
05	Coahuila	0.0	0.0	407.7	0.0	0.0	0.0
06	Colima	0.0	0.0	56.2	0.0	0.0	0.0
07	Chiapas	0.0	0.0	89.6	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	401.3	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	3,062.9	0.0	0.0	0.0
10	Durango	0.0	0.0	692.7	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	359.4	0.0	0.0	0.0
12	Guerrero	0.0	0.0	133.1	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	120.7	0.0	0.0	0.0
14	Jalisco	0.0	0.0	761.0	0.0	0.0	0.0
15	México	0.0	0.0	1,651.7	0.0	0.0	0.0
16	Michoacán	0.0	0.0	198.3	0.0	0.0	0.0
17	Morelos	0.0	0.0	148.4	0.0	0.0	0.0
18	Nayarit	0.0	0.0	62.6	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	353.7	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	122.0	0.0	0.0	0.0
21	Puebla	0.0	0.0	427.7	0.0	0.0	0.0
22	Querétaro	0.0	0.0	123.3	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	246.9	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	169.7	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	189.1	0.0	0.0	0.0
26	Sonora	0.0	0.0	246.9	0.0	0.0	0.0
27	Tabasco	0.0	0.0	76.9	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	293.0	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	106.8	0.0	0.0	0.0
30	Veracruz	0.0	0.0	415.6	0.0	0.0	0.0
31	Yucatán	0.0	0.0	141.4	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	52.4	0.0	0.0	0.0
National		0.0	0.0	12,666.8	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: B

Overall Rating: B

Date: April 6, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Graphic Arts

DESCRIPTION:

Various graphic arts processes including typography, offset (web and sheet), rotogravure, silk screening, and flexography.

POLLUTANTS:

VOC

METHOD:

Per capita emission factors derived from Mexico ink sales.

ACTIVITY DATA:

Population (INEGI, 2000a)

EMISSION FACTORS:

- Per capita emission factor calculated from ink sales data – 0.3676 kg/person-year (ANAFAPYT, 2004)

NOTES AND ASSUMPTIONS:

Component-specific emission rates obtained from EIIP guidance (EIIP, 1996b).

SAMPLE CALCULATIONS:

Estimate the total annual VOC emissions from architectural surface coatings in Baja California.

State level emissions:

Population of Baja California = 2,487,367
Per capita VOC emission factor = 0.3676 kg/person/year

Annual VOC emissions = $2,487,367 \times 0.3676 = 914,356 \text{ kg} = 914.4 \text{ Mg}$

Municipality level emissions – Mexicali:

Population of Mexicali = 764,602
Per capita VOC emission factor = 0.3676 kg/person/year

Annual VOC emissions = $764,602 \times 0.3676 = 281,068 \text{ kg} = 281.1 \text{ Mg}$

Graphic Arts							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	347.1	0.0	0.0	0.0
02	Baja California	0.0	0.0	914.4	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	155.9	0.0	0.0	0.0
04	Campeche	0.0	0.0	253.9	0.0	0.0	0.0
05	Coahuila	0.0	0.0	844.8	0.0	0.0	0.0
06	Colima	0.0	0.0	199.5	0.0	0.0	0.0
07	Chiapas	0.0	0.0	1,441.3	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	1,122.3	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	3,163.3	0.0	0.0	0.0
10	Durango	0.0	0.0	532.5	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	1,714.1	0.0	0.0	0.0
12	Guerrero	0.0	0.0	1,132.1	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	821.8	0.0	0.0	0.0
14	Jalisco	0.0	0.0	2,324.0	0.0	0.0	0.0
15	México	0.0	0.0	4,814.3	0.0	0.0	0.0
16	Michoacán	0.0	0.0	1,465.1	0.0	0.0	0.0
17	Morelos	0.0	0.0	571.7	0.0	0.0	0.0
18	Nayarit	0.0	0.0	338.3	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	1,409.4	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	1,264.1	0.0	0.0	0.0
21	Puebla	0.0	0.0	1,866.2	0.0	0.0	0.0
22	Querétaro	0.0	0.0	516.2	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	321.6	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	845.2	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	932.5	0.0	0.0	0.0
26	Sonora	0.0	0.0	815.0	0.0	0.0	0.0
27	Tabasco	0.0	0.0	695.4	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	1,012.1	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	353.9	0.0	0.0	0.0
30	Veracruz	0.0	0.0	2,539.7	0.0	0.0	0.0
31	Yucatán	0.0	0.0	609.6	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	497.6	0.0	0.0	0.0
National		0.0	0.0	35,834.9	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: B

Overall Rating: B

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Traffic Markings

DESCRIPTION:

Various emission sources in this source category include painting of centerlines, edge stripes, directional markings, and paved and unpaved surfaces to improve traffic flow. These include solvent- and water-based paints.

POLLUTANTS:

VOC

METHOD:

Material Balance

ACTIVITY DATA:

- National traffic marking sales statistics (ANAFAPYT, 2003)
- National and municipality level paved road lengths (lane-kilometers) (INEGI, 2002a)

EMISSION FACTORS:

- Not applicable

NOTES AND ASSUMPTIONS:

- The paint and thinner sales data provided by ANAFAPYT accounted for 90% of sales in Mexico, these data were extrapolated to 100%.
- The VOC content was assumed to be (0.150 kg/liter) (GDF, 2001) and 0.85 kg/liter for thinner.
- Overall thinner and solvent use allocated to traffic markings based upon relative ANAFAPYT paint quantities.
- Traffic marking use is proportional to paved road length (i.e., *pavimentada* and *revestida* classifications) (INEGI, 2002a).
- Municipality-level paved road lengths were available for 26 states; road lengths estimated using a ratio of municipality area to state area for remaining 6 states (Chiapas, Chihuahua, Distrito Federal, Guerrero, Oaxaca, and Puebla),

SAMPLE CALCULATIONS:

Estimate the total annual emissions from traffic markings in Baja California.

National level emissions:

Quantity of traffic markings used = $(100/90) \times 4,900,000 \text{ liters/year} = 5,444,444 \text{ liters/year}$

National VOC emissions (traffic markings only) = $0.150 \text{ kg/liter} \times 5,444,444 \text{ liters/year} = 816,667 \text{ kg/year}$
= 816.7 Mg/year

National thinner used (all paints) = $(100/90) \times 66,780,000 \text{ liters/year} = 74,200,000 \text{ liters/year}$

National VOC (thinner – all paints) = $0.85 \text{ kg/liter} \times 74,200,000 \text{ liters/year} = 63,070,000 \text{ kg/year}$

Quantity of total paints used (all paints) = 155,017,778 liters/year

National VOC emissions (thinner – traffic paints) = $63,070,000 \text{ kg/yr} \times ([5,444,444 \text{ liters/year}]/[155,017,778 \text{ liters/year}]) = 2,215.1 \text{ Mg/year}$

Total VOC emissions (paint plus thinner) = 816.7 Mg/year + 2,215.1 Mg/year = 3,031.8 Mg/year

State level emissions:

National paved road length = 237,635 km

Paved road length in Baja California = 6,805.7 km

Annual VOC emissions = $(6,805.7 \text{ km}/237,635 \text{ km}) \times 3,031.8 \text{ Mg} = 86.8 \text{ Mg}$

Municipality level emissions – Mexicali:

State paved road length = 6,805.7 km

Paved road length in Mexicali = 4,057.4 km

Annual VOC emissions = $(4,057.4 \text{ km}/6,805.7 \text{ km}) \times 86.8 \text{ Mg} = 51.8 \text{ Mg}$

Traffic Markings							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	24.7	0.0	0.0	0.0
02	Baja California	0.0	0.0	86.8	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	43.8	0.0	0.0	0.0
04	Campeche	0.0	0.0	56.3	0.0	0.0	0.0
05	Coahuila	0.0	0.0	107.0	0.0	0.0	0.0
06	Colima	0.0	0.0	20.7	0.0	0.0	0.0
07	Chiapas	0.0	0.0	274.9	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	150.8	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	129.9	0.0	0.0	0.0
10	Durango	0.0	0.0	104.5	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	49.3	0.0	0.0	0.0
12	Guerrero	0.0	0.0	129.0	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	25.0	0.0	0.0	0.0
14	Jalisco	0.0	0.0	87.0	0.0	0.0	0.0
15	México	0.0	0.0	123.8	0.0	0.0	0.0
16	Michoacán	0.0	0.0	110.4	0.0	0.0	0.0
17	Morelos	0.0	0.0	25.3	0.0	0.0	0.0
18	Nayarit	0.0	0.0	42.4	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	92.7	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	162.7	0.0	0.0	0.0
21	Puebla	0.0	0.0	107.9	0.0	0.0	0.0
22	Querétaro	0.0	0.0	40.5	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	64.5	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	142.8	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	117.4	0.0	0.0	0.0
26	Sonora	0.0	0.0	83.0	0.0	0.0	0.0
27	Tabasco	0.0	0.0	109.2	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	98.3	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	33.0	0.0	0.0	0.0
30	Veracruz	0.0	0.0	151.8	0.0	0.0	0.0
31	Yucatán	0.0	0.0	109.6	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	126.7	0.0	0.0	0.0
National		0.0	0.0	3,031.7	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: B

Overall Rating: B

Date: April 7, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Asphalt Application

DESCRIPTION:

Asphalt application to surfaces and pavements results in hydrocarbon emissions due to evaporation.

POLLUTANTS:

VOC

METHOD:

Material balance

ACTIVITY DATA:

- National asphalt sales statistics (PEMEX, 2003f)
- National and municipality level paved road lengths (INEGI, 2002a)

EMISSION FACTORS:

- Not applicable

NOTES AND ASSUMPTIONS:

- Cutback fraction of total asphalt is assumed to be similar to the U.S. (i.e., 3.06% of total asphalt).
- Asphalt is assumed to be a medium-cure cutback.
- Diluent content is assumed to be 35% (EIIP, 2001c).
- Diluent density is assumed to be 0.8 kg/liter (EIIP, 2001c).
- Evaporated fraction of diluent is assumed to be 75% (EIIP, 2001c).
- Emissions from hot-mix and emulsified asphalts are assumed to be negligible (EIIP, 2001c).

SAMPLE CALCULATIONS:

Estimate annual emissions from asphalt application in Baja California.

National level emissions:

National asphalt usage = 1,206,976,160 liters/year

$$\text{National VOC emissions} = 1,206,976,160 \text{ liters/year} \times 0.0306 \times 0.35 \times 0.8 \text{ kg/liter} \times 0.75 = 7,755,967 \text{ kg/year}$$
$$= 7,756.0 \text{ Mg/year}$$

State level emissions:

National paved road length = 237,635 km

State paved road length = 6,805.7 km

$$\text{Annual VOC emissions in Baja California} = 7,756.0 \text{ Mg/year} \times (6,805.7 \text{ km}/237,635 \text{ km}) = 222.1 \text{ Mg}$$

Municipality level emissions – Mexicali:

State paved road length = 6,805.7 km

Paved road length in Mexicali = 4,057.4 km

$$\text{Annual VOC emissions in Mexicali} = 222.1 \text{ Mg} \times (4,057.4 \text{ km}/6,805.7 \text{ km}) = 132.4 \text{ Mg}$$

Asphalt Application							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	63.1	0.0	0.0	0.0
02	Baja California	0.0	0.0	222.1	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	111.9	0.0	0.0	0.0
04	Campeche	0.0	0.0	144.1	0.0	0.0	0.0
05	Coahuila	0.0	0.0	273.6	0.0	0.0	0.0
06	Colima	0.0	0.0	52.9	0.0	0.0	0.0
07	Chiapas	0.0	0.0	703.1	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	385.9	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	332.3	0.0	0.0	0.0
10	Durango	0.0	0.0	267.2	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	126.2	0.0	0.0	0.0
12	Guerrero	0.0	0.0	329.9	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	64.0	0.0	0.0	0.0
14	Jalisco	0.0	0.0	222.7	0.0	0.0	0.0
15	México	0.0	0.0	316.7	0.0	0.0	0.0
16	Michoacán	0.0	0.0	282.5	0.0	0.0	0.0
17	Morelos	0.0	0.0	64.8	0.0	0.0	0.0
18	Nayarit	0.0	0.0	108.5	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	237.1	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	416.3	0.0	0.0	0.0
21	Puebla	0.0	0.0	276.1	0.0	0.0	0.0
22	Querétaro	0.0	0.0	103.7	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	165.1	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	365.3	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	300.4	0.0	0.0	0.0
26	Sonora	0.0	0.0	212.4	0.0	0.0	0.0
27	Tabasco	0.0	0.0	279.3	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	251.6	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	84.4	0.0	0.0	0.0
30	Veracruz	0.0	0.0	388.3	0.0	0.0	0.0
31	Yucatán	0.0	0.0	280.3	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	324.2	0.0	0.0	0.0
National		0.0	0.0	7,756.0	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: C

Overall Rating: C

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Bakeries

DESCRIPTION:

Volatile organic compound emissions (primarily ethanol) from yeast fermentation process in bakeries.

POLLUTANTS:

VOC

METHOD:

Emission factors

ACTIVITY DATA:

- Population (INEGI, 2000a)
- Per-capita bread consumption = 25 kg/person-year (Puratos, 2004)

EMISSION FACTORS:

- VOC emission factor – 5 kg VOC/Mg baked bread (EIIP, 1999)

NOTES AND ASSUMPTIONS:

- Yeast dough mixing process is sponge dough.

SAMPLE CALCULATIONS:

Estimate the total annual emissions from bakeries in Baja California.

State Level Emissions – Baja California:

Population of Baja California = 2,487,367

Annual state wide bread consumption = $2,487,367 \times 25 \text{ kg/person-year} = 62,184,175 \text{ kg} = 62,184.2 \text{ Mg bread}$

VOC emission factor = 5 kg VOC/Mg baked bread

Annual VOC emissions = $62,184.2 \text{ Mg bread} \times 5 \text{ kg VOC/Mg baked bread} = 310,921 \text{ kg} = 310.9 \text{ Mg}$

Municipality Level Emissions – Mexicali:

Population of Mexicali = 764,602

Annual municipality wide bread consumption = $764,602 \times 25 \text{ kg/person-year} = 19,115,050 \text{ kg} = 19,115.0 \text{ Mg}$

VOC emission factor = 5 kg VOC/Mg baked bread

Annual VOC emissions = $19,115 \times 5 \text{ kg VOC/Mg baked bread} = 95,575 \text{ kg} = 95.6 \text{ Mg}$

Bakeries							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	118.0	0.0	0.0	0.0
02	Baja California	0.0	0.0	310.9	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	53.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	86.3	0.0	0.0	0.0
05	Coahuila	0.0	0.0	287.3	0.0	0.0	0.0
06	Colima	0.0	0.0	67.8	0.0	0.0	0.0
07	Chiapas	0.0	0.0	490.1	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	381.6	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	1,075.7	0.0	0.0	0.0
10	Durango	0.0	0.0	181.1	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	582.9	0.0	0.0	0.0
12	Guerrero	0.0	0.0	385.0	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	279.4	0.0	0.0	0.0
14	Jalisco	0.0	0.0	790.3	0.0	0.0	0.0
15	México	0.0	0.0	1,637.1	0.0	0.0	0.0
16	Michoacán	0.0	0.0	498.2	0.0	0.0	0.0
17	Morelos	0.0	0.0	194.4	0.0	0.0	0.0
18	Nayarit	0.0	0.0	115.0	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	479.3	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	429.8	0.0	0.0	0.0
21	Puebla	0.0	0.0	634.6	0.0	0.0	0.0
22	Querétaro	0.0	0.0	175.5	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	109.4	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	287.4	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	317.1	0.0	0.0	0.0
26	Sonora	0.0	0.0	277.1	0.0	0.0	0.0
27	Tabasco	0.0	0.0	236.5	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	344.2	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	120.3	0.0	0.0	0.0
30	Veracruz	0.0	0.0	863.6	0.0	0.0	0.0
31	Yucatán	0.0	0.0	207.3	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	169.2	0.0	0.0	0.0
National		0.0	0.0	12,185.4	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Wastewater Treatment

DESCRIPTION:

Volatile organic compound emissions from collection, contaminant treatment, and/or storage of industrial wastewater streams. These streams are discharged into either a receiving body of water or a municipal treatment plant.

POLLUTANTS:

VOC

METHOD:

Emission factors

ACTIVITY DATA:

- National level quantity of industrial wastewater (CNA, 2003)
- Municipality level municipal treatment plant statistics (INEGI, 2002a)

EMISSION FACTORS:

- TOG – 1.3×10^{-5} kg/liter (Radian, 1997; U.S. EPA, 1991)

NOTES AND ASSUMPTIONS:

- VOC emissions equal TOG emissions.
- VOC emissions are allocated to municipalities based on the total installed capacity of municipal treatment plants located in each municipality.
- Emissions for the state of Jalisco are likely underestimated because statistics on total installed capacity of municipal treatment plants were limited to the Guadalajara metropolitan area.
Wastewater quantity from the following type of industries was used to estimate national VOC emissions: sugar, petroleum, services, chemical and pharmaceuticals, paper, food and beverage, beer, minerals, textiles, distilleries, coffee, leather, manufacturing industries, and metallurgical industries (CNA, 2003).

SAMPLE CALCULATIONS:

Estimate the total annual VOC emissions from industrial wastewater treatment in Baja California.

National level emissions:

Annual quantity of industrial wastewater = $3,174,098,400 \text{ m}^3/\text{year}$

Annual TOG emissions = $1.3 \times 10^{-5} \text{ kg/liter} \times 3,174,098,400,000 \text{ liters/year} = 41,263,279 \text{ kg/year} = 41,263.3 \text{ Mg/year}$

Annual VOC emissions = 41,263.3 Mg/year

State level emissions:

Total installed capacity of public treatment plants in Baja California = 4,757.0 liters/sec

National level total installed capacity of public treatment plants = 111,719.6 liters/sec

Annual VOC emissions in Baja California = $41,263.3 \text{ Mg} \times (4,757.0 / 111,719.6) = 1,757.0 \text{ Mg}$

Municipality level emissions – Mexicali:

Total installed capacity of public treatment plants in the municipality of Mexicali = 1,260 liters/sec

Annual VOC emissions in Mexicali = $1,757.0 \text{ Mg} \times (1,260.0 / 4,757.0) = 465.4 \text{ Mg}$

Wastewater Treatment							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	1,094.3	0.0	0.0	0.0
02	Baja California	0.0	0.0	1,757.0	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	493.4	0.0	0.0	0.0
04	Campeche	0.0	0.0	101.1	0.0	0.0	0.0
05	Coahuila	0.0	0.0	701.1	0.0	0.0	0.0
06	Colima	0.0	0.0	422.4	0.0	0.0	0.0
07	Chiapas	0.0	0.0	298.8	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	2,387.1	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	2,364.0	0.0	0.0	0.0
10	Durango	0.0	0.0	1,735.6	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	1,788.8	0.0	0.0	0.0
12	Guerrero	0.0	0.0	933.6	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	603.4	0.0	0.0	0.0
14	Jalisco	0.0	0.0	92.5	0.0	0.0	0.0
15	México	0.0	0.0	987.8	0.0	0.0	0.0
16	Michoacán	0.0	0.0	1,483.2	0.0	0.0	0.0
17	Morelos	0.0	0.0	727.0	0.0	0.0	0.0
18	Nayarit	0.0	0.0	757.6	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	4,791.1	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	215.0	0.0	0.0	0.0
21	Puebla	0.0	0.0	1,774.9	0.0	0.0	0.0
22	Querétaro	0.0	0.0	603.4	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	616.8	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	651.5	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	1,052.3	0.0	0.0	0.0
26	Sonora	0.0	0.0	1,281.8	0.0	0.0	0.0
27	Tabasco	0.0	0.0	473.9	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	1,756.6	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	253.7	0.0	0.0	0.0
30	Veracruz	0.0	0.0	8,821.1	0.0	0.0	0.0
31	Yucatán	0.0	0.0	71.6	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	170.9	0.0	0.0	0.0
National		0.0	0.0	41,263.3	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Agricultural Tilling

DESCRIPTION:

Fugitive dust emissions from agricultural tilling.

POLLUTANTS:

PM₁₀ and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Total cultivated area by crop type (SAGARPA, 2003a)
- Number of hectare passes by crop type (ARB, 2003)

EMISSION FACTORS (kg/hectare-pass by crop type):

- 3.45 – sorghum, wheat, barley, and oats; 3.09 – alfalfa and hay/grass; 1.84 – corn and sugarcane; 1.66 – beans and chickpeas; 1.57 – green chilis; 1.37 – coffee, oranges, coconut/copra, mango, lemon, and agave; 1.15 – avocado; and 0.00 – pasture (ARB, 2003)

NOTES AND ASSUMPTIONS:

- PM_{2.5} particle size fraction of PM₁₀ is 0.2217 (ARB, 2002).
- It is assumed that Mexican agricultural tilling practices (i.e., hectare-passes/hectare) are similar to San Joaquin Valley, California.

SAMPLE CALCULATIONS:

Estimate annual emissions from agricultural tilling operations in Baja California.

State level emissions – Baja California:

Total cultivated area for wheat = 73,919 hectares

$$\begin{aligned} \text{Annual PM}_{10} \text{ emissions from wheat grain} &= 73,919 \text{ hectares} \times 3.45 \text{ kg/hectare-pass} \times 1.2 \text{ hectare-passes/hectare} \\ &= 306,025 \text{ kg} = 306.0 \text{ Mg} \end{aligned}$$

$$\text{Annual PM}_{2.5} \text{ emissions from wheat grain} = 306.0 \text{ Mg} \times 0.2217 = 67.8 \text{ Mg}$$

$$\begin{aligned} \text{Annual PM}_{10} \text{ emissions from agricultural tilling operations for all crop types in Baja California} &= 11.7 + 1.6 + 18.0 + 306.0 \\ &+ 58.7 + 0.05 + 120.8 + 2.7 + 4.2 + 0.03 + 0.02 + 9.4 + 6.2 = 539.6 \text{ Mg} \end{aligned}$$

$$\begin{aligned} \text{Annual PM}_{2.5} \text{ emissions from agricultural tilling operations for all crop types in Baja California} &= 539.6 \text{ Mg} \times 0.2217 \\ &= 119.6 \text{ Mg} \end{aligned}$$

Municipality level emissions – Mexicali:

Total cultivated area for wheat = 65,031 hectares

$$\begin{aligned} \text{Annual PM}_{10} \text{ emissions from wheat grain} &= 65,031 \text{ hectares} \times 3.45 \text{ kg/hectare-pass} \times 1.2 \text{ hectare-passes/hectare} \\ &= 269,228 \text{ kg} = 269.2 \text{ Mg} \end{aligned}$$

$$\text{Annual PM}_{2.5} \text{ emissions from wheat grain} = 269.2 \text{ Mg} \times 0.2217 = 59.7 \text{ Mg}$$

$$\begin{aligned} \text{Annual PM}_{10} \text{ emissions from agricultural tilling operations for all crop types in Baja California} &= 7.4 + 1.4 + 18.0 + 269.2 \\ &+ 9.9 + 0.03 + 120.8 + 4.1 + 0.01 + 0.4 = 431.3 \text{ Mg} \end{aligned}$$

$$\begin{aligned} \text{Annual PM}_{2.5} \text{ emissions from agricultural tilling operations for all crop types in Baja California} &= 431.3 \text{ Mg} \times 0.2217 \\ &= 95.6 \text{ Mg} \end{aligned}$$

Agricultural Tilling							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	1,032.3	228.9
02	Baja California	0.0	0.0	0.0	0.0	539.6	119.6
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	0.0	0.0	1,341.0	297.3
05	Coahuila	0.0	0.0	0.0	0.0	957.6	212.3
06	Colima	0.0	0.0	0.0	0.0	231.1	51.2
07	Chiapas	0.0	0.0	0.0	0.0	8,848.8	1,961.8
08	Chihuahua	0.0	0.0	0.0	0.0	5,256.0	1,165.3
09	Distrito Federal	0.0	0.0	0.0	0.0	96.6	21.4
10	Durango	0.0	0.0	0.0	0.0	4,167.3	923.9
11	Guanajuato	0.0	0.0	0.0	0.0	6,334.3	1,404.3
12	Guerrero	0.0	0.0	0.0	0.0	3,998.3	886.4
13	Hidalgo	0.0	0.0	0.0	0.0	3,276.2	726.3
14	Jalisco	0.0	0.0	0.0	0.0	7,427.0	1,646.6
15	México	0.0	0.0	0.0	0.0	5,400.0	1,197.2
16	Michoacán	0.0	0.0	0.0	0.0	5,106.0	1,132.0
17	Morelos	0.0	0.0	0.0	0.0	626.1	138.8
18	Nayarit	0.0	0.0	0.0	0.0	1,587.0	351.8
19	Nuevo León	0.0	0.0	0.0	0.0	909.3	201.6
20	Oaxaca	0.0	0.0	0.0	0.0	5,606.8	1,243.0
21	Puebla	0.0	0.0	0.0	0.0	5,560.3	1,232.7
22	Querétaro	0.0	0.0	0.0	0.0	1,191.8	264.2
23	Quintana Roo	0.0	0.0	0.0	0.0	913.7	202.6
24	San Luis Potosí	0.0	0.0	0.0	0.0	3,815.5	845.9
25	Sinaloa	0.0	0.0	0.0	0.0	7,023.0	1,557.0
26	Sonora	0.0	0.0	0.0	0.0	1,959.3	434.4
27	Tabasco	0.0	0.0	0.0	0.0	1,136.1	251.9
28	Tamaulipas	0.0	0.0	0.0	0.0	5,890.4	1,305.9
29	Tlaxcala	0.0	0.0	0.0	0.0	1,449.1	321.3
30	Veracruz	0.0	0.0	0.0	0.0	7,266.7	1,611.0
31	Yucatán	0.0	0.0	0.0	0.0	1,375.0	304.8
32	Zacatecas	0.0	0.0	0.0	0.0	9,543.7	2,115.8
National		0.0	0.0	0.0	0.0	109,865.9	24,357.2

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Agricultural Burning

DESCRIPTION:

Emissions from burning of agricultural residue.

POLLUTANTS:

VOC, CO, PM₁₀ and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Total cultivated area by crop type (SAGARPA, 2003a)
- Fuel loading by crop type (U.S. EPA, 1995 [Section 2.5 – Updated January 1995])

EMISSION FACTORS (kg/Mg biomass burned):

- Wheat – VOC: 4.5 kg/Mg; CO: 54.0 kg/Mg; and PM: 6.0 kg/Mg
- Sugarcane – VOC: 4.0 kg/Mg; CO: 35.5 kg/Mg; and PM: 2.9 kg/Mg

NOTES AND ASSUMPTIONS:

- PM₁₀ particle size fraction of total PM is 0.9835 (ARB, 2002).
- PM_{2.5} particle size fraction of total PM is 0.9379 (ARB, 2002).
- 2,200,000 Mg of sugarcane residue is burned in Mexico in 2002 based on an undocumented source (SAGARPA, 2003b).
- Wheat crop burn fraction is 60% for Baja California, Baja California Sur, Chihuahua, Coahuila, Durango, Nuevo León, Sonora, Sinaloa, and Tamaulipas and 30% for all other remaining states based on an undocumented source (SAGARPA, 2003b).
- Agricultural burning emissions are likely to be underestimated because burn information for other crops besides wheat and sugarcane are not available.

SAMPLE CALCULATIONS:

Estimate annual VOC emissions from agricultural burning of sugarcane and wheat in Sonora.

National level VOC emissions from sugarcane burning = 2,200,000 Mg/yr × 4 kg/Mg = 8,800 Mg/yr

State level emissions – Sonora:

Total cultivated area for wheat = 290,895.2 hectares

Total cultivated area for sugarcane = 25 hectares

National level cultivated area for sugarcane = 679,743.3 hectares

Wheat burn fraction = 0.6

Annual VOC emissions from sugarcane burning = (25/679,743.3) × 8,800 Mg = 0.3 Mg

Annual VOC emissions from wheat crop residue burning = (290,895.2 hectares × 0.6 × 4 Mg/hectare × 4.5 kg/Mg)/1000
= 3,141.7 Mg

Total annual VOC emissions from agricultural burning in Sonora = 0.3 Mg + 3,141.7 Mg = 3,142.0 Mg

Municipality level emissions – Ures:

Total cultivated area for wheat = 514 hectares

Total cultivated area for sugarcane = 25 hectares

Annual VOC emissions from wheat burning = (514 hectares × 0.6 × 4 Mg/hectare × 4.5 kg/Mg)/1000 = 5.6 Mg

Annual VOC emissions from sugarcane burning = (25/679,743.3) × 8,800 Mg = 0.3 Mg

Total annual VOC emissions from agricultural burning in the municipality of Ures = 5.6 Mg + 0.3 Mg = 5.9 Mg

Agricultural Burning							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	0.0
02	Baja California	0.0	0.0	798.3	9,579.9	1,046.9	998.3
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	79.4	704.9	56.6	54.0
05	Coahuila	0.0	0.0	61.1	733.4	80.1	76.4
06	Colima	0.0	0.0	111.0	985.2	79.2	75.5
07	Chiapas	0.0	0.0	366.7	3,258.2	262.2	250.0
08	Chihuahua	0.0	0.0	81.9	983.2	107.4	102.5
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	0.0	0.0	17.2	206.5	22.6	21.5
11	Guanajuato	0.0	0.0	315.8	3,789.8	414.1	394.9
12	Guerrero	0.0	0.0	13.4	118.7	9.5	9.1
13	Hidalgo	0.0	0.0	64.5	631.7	57.3	54.7
14	Jalisco	0.0	0.0	987.8	8,990.1	747.1	712.5
15	México	0.0	0.0	151.0	1,796.8	195.1	186.0
16	Michoacán	0.0	0.0	407.8	4,150.8	392.6	374.4
17	Morelos	0.0	0.0	215.8	1,931.9	157.0	149.8
18	Nayarit	0.0	0.0	362.1	3,213.9	258.2	246.2
19	Nuevo León	0.0	0.0	246.7	2,960.2	323.5	308.5
20	Oaxaca	0.0	0.0	781.7	7,221.9	611.8	583.4
21	Puebla	0.0	0.0	207.0	1,946.4	168.5	160.7
22	Querétaro	0.0	0.0	6.0	72.5	7.9	7.6
23	Quintana Roo	0.0	0.0	308.8	2,741.0	220.2	210.0
24	San Luis Potosí	0.0	0.0	807.2	7,164.3	575.7	549.0
25	Sinaloa	0.0	0.0	792.2	8,474.9	841.4	802.4
26	Sonora	0.0	0.0	3,142.0	37,702.9	4,120.0	3,929.0
27	Tabasco	0.0	0.0	349.6	3,102.5	249.3	237.7
28	Tamaulipas	0.0	0.0	598.1	5,346.3	433.8	413.7
29	Tlaxcala	0.0	0.0	172.3	2,067.6	225.9	215.5
30	Veracruz	0.0	0.0	3,212.7	28,530.3	2,294.1	2,187.7
31	Yucatán	0.0	0.0	1.4	12.1	1.0	0.9
32	Zacatecas	0.0	0.0	12.7	150.8	16.3	15.6
National		0.0	0.0	14,672.2	148,568.7	13,975.3	13,327.5

Activity Data Rating: E

Emission Factor Rating: D

Overall Rating: E

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Livestock Ammonia

DESCRIPTION:

The sources of ammonia emissions in this category are livestock and domesticated farm and dairy animals.

POLLUTANTS:

NH₃

METHOD:

Livestock population statistics and emission factors.

ACTIVITY DATA:

- Livestock population (INEGI, 2002b)

EMISSION FACTORS:

- Dairy cows – 21.30 kg/head-year; beef cattle – 4.37 kg/head-year; pigs – 4.05 kg/head-year; sheep – 3.37 kg/head-year; goats – 6.39 kg/head-year; horses – 12.20 kg/head-year; chicken – 0.19 kg/head-year; turkeys – 0.68 kg/head-year (U.S. EPA, 1992; U.S. EPA, 2004b)

ASSUMPTIONS:

- Livestock statistics represent year-round livestock populations.
- Municipality-level livestock populations were not available for the states of Chiapas, Guerrero, Nuevo León, Oaxaca, Puebla, and Sinaloa; district-level livestock population were allocated to the municipality-level based on municipality land area.
- Emission factors were developed from U.S.-based manure management train (MMT)-specific emission factors combined with a Mexico-specific distribution of MMTs (U.S. EPA, 1992; U.S. EPA, 2004b).
- Chicken populations are assumed to consist of 22% layers and 78% broilers (U.S. EPA, 2004b).

SAMPLE CALCULATIONS:

Estimate the total annual livestock ammonia emissions in Baja California.

State level emissions:

Emissions from dairy cows = (212,929 head) × (21.30 kg NH₃/head-year) = 4,535,415 kg = 4,534.4 Mg
Emissions from beef cattle = (208,911 head) × (4.37 kg NH₃/head-year) = 913,592 kg = 913.6 Mg
Emissions from pigs = (20,726 head) × (4.05 kg NH₃/head-year) = 83,917 kg = 83.9 Mg
Emissions from sheep = (10,044 head) × (3.37 kg NH₃/head-year) = 33,844 kg = 33.8 Mg
Emissions from goats = (21,739 head) × (6.39 kg NH₃/head-year) = 139,011 kg = 139.0 Mg
Emissions from horses = (3,599 head) × (12.20 kg NH₃/head-year) = 43,906 kg = 43.9 Mg
Emissions from chickens = (686,274 head) × (0.19 kg NH₃/head-year) = 130,827 kg = 130.8 Mg

Total annual NH₃ emissions = 4,534.4 + 913.6 + 83.9 + 33.8 + 139.0 + 43.9 + 130.8 = 5,879.4 Mg

Municipality level emissions – Mexicali:

Emissions from dairy cows = (106,330 head) × (21.30 kg NH₃/head-year) = 2,264,343 kg = 2,264.3 Mg
Emissions from beef cattle = (104,324 head) × (4.37 kg NH₃/head-year) = 456,219 kg = 456.2 Mg
Emissions from pigs = (10,472 head) × (4.05 kg NH₃/head-year) = 42,400 kg = 42.4 Mg
Emissions from sheep = (4,332 head) × (3.37 kg NH₃/head-year) = 14,597 kg = 14.6 Mg
Emissions from goats = (6,979 head) × (6.39 kg NH₃/head-year) = 44,628 kg = 44.6 Mg
Emissions from horses = (3,368 head) × (12.20 kg NH₃/head-year) = 41,088 kg = 41.1 Mg
Emissions from chickens = (440,946 head) × (0.19 kg NH₃/head-year) = 84,059 kg = 84.1 Mg

Total annual NH₃ emissions = 2,264.3 + 456.2 + 42.4 + 14.6 + 44.6 + 41.1 + 84.1 = 2,947.3 Mg

Livestock Ammonia							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	21,168.6
02	Baja California	0.0	0.0	0.0	0.0	0.0	5,879.5
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	4,760.0
04	Campeche	0.0	0.0	0.0	0.0	0.0	12,912.7
05	Coahuila	0.0	0.0	0.0	0.0	0.0	23,501.1
06	Colima	0.0	0.0	0.0	0.0	0.0	4,542.5
07	Chiapas	0.0	0.0	0.0	0.0	0.0	73,759.4
08	Chihuahua	0.0	0.0	0.0	0.0	0.0	28,685.3
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	737.1
10	Durango	0.0	0.0	0.0	0.0	0.0	41,119.7
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	39,044.3
12	Guerrero	0.0	0.0	0.0	0.0	0.0	44,306.6
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	21,204.4
14	Jalisco	0.0	0.0	0.0	0.0	0.0	119,735.6
15	México	0.0	0.0	0.0	0.0	0.0	28,614.8
16	Michoacán	0.0	0.0	0.0	0.0	0.0	59,613.7
17	Morelos	0.0	0.0	0.0	0.0	0.0	8,735.4
18	Nayarit	0.0	0.0	0.0	0.0	0.0	19,269.3
19	Nuevo León	0.0	0.0	0.0	0.0	0.0	14,835.2
20	Oaxaca	0.0	0.0	0.0	0.0	0.0	52,484.3
21	Puebla	0.0	0.0	0.0	0.0	0.0	48,116.3
22	Querétaro	0.0	0.0	0.0	0.0	0.0	12,582.1
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	3,505.7
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	30,300.3
25	Sinaloa	0.0	0.0	0.0	0.0	0.0	50,207.9
26	Sonora	0.0	0.0	0.0	0.0	0.0	40,929.5
27	Tabasco	0.0	0.0	0.0	0.0	0.0	37,770.2
28	Tamaulipas	0.0	0.0	0.0	0.0	0.0	30,365.6
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	4,604.2
30	Veracruz	0.0	0.0	0.0	0.0	0.0	105,384.3
31	Yucatán	0.0	0.0	0.0	0.0	0.0	25,916.4
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	29,647.5
National		0.0	0.0	0.0	0.0	0.0	1,044,239.5

Activity Data Rating: A

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Fertilizer Application

DESCRIPTION:

Ammonia emissions from the application of nitrogen based fertilizers. The amount of ammonia emissions depend on the nitrogen content of the fertilizer.

POLLUTANTS:

NH₃

METHOD:

Emission factors

ACTIVITY DATA:

- Fertilizer annual production, imports and export statistics (SENER, 2002d)
- Municipality-level fertilized acreage (INEGI, 2002b)

EMISSION FACTORS:

- Nitrogen content (%N): NPK – 11.2%; ammonium phosphates – 15.5%; ammonium nitrate – 33.9%; ammonium sulfate – 21%; urea – 45.9%; special fertilizers (foliares) and other special fertilizers – 30% (Battye et al., 1994)
- NH₃ emission factors (kg NH₃/Mg N): NPK – 48; ammonium phosphates – 48; ammonium nitrate – 25; ammonium sulfate – 97; urea – 182; special fertilizers (foliares) and other special fertilizers – 30 (Battye et al., 1994)

NOTES AND ASSUMPTIONS:

- Special fertilizers (foliares) and other special fertilizers were assumed to contain 30% nitrogen.
- Emission factor for other straight nitrogen fertilizers was used for special fertilizers (foliares) and other special fertilizers.
- Emissions were allocated based upon municipality-level fertilized acreage.
- Municipality-level fertilized acreage was available for 18 states.
- State-level fertilized acreage only was available for 9 states (Campeche, Coahuila, Guerrero, Jalisco, State of Mexico, Oaxaca, Sinaloa, Sonora, and Tamaulipas); municipality-level fertilized acreage was estimated based upon municipality area.
- Fertilized acreage information was unavailable for 5 states (Chiapas, Michoacán, Nayarit, Nuevo León, and Yucatán). It was assumed that state-level fertilized acreage was equal to state-level crop acreage; municipality-level fertilized acreage was estimated based upon municipality area.

SAMPLE CALCULATIONS:

Estimate the total annual emissions from urea application in Baja California.

National Level Emissions from urea application:

$$\text{Urea usage} = \text{production} + \text{imports} - \text{exports} = 395,088 + 1,151,108 - 75,582 = 1,470,614 \text{ Mg/yr}$$

Nitrogen content of urea = 45.9%

$$\text{NH}_3 \text{ emissions} = 1,470,614 \text{ Mg} \times 0.459 \times 182 \text{ kg NH}_3/\text{Mg N} = 122,852,152 \text{ kg} = 122,852.2 \text{ Mg/yr}$$

State Level Emissions – Baja California:

Fertilized acreage in Baja California = 183,302.1 hectares

National level fertilized acreage = 14,159,905.5 hectares

$$\text{Annual NH}_3 \text{ emissions from urea application} = (183,302.1 / 14,159,905.5) \times 122,852.2 \text{ Mg} = 1,590.3 \text{ Mg}$$

Municipality Level Emissions – Mexicali:

Fertilized acreage in the municipality of Mexicali = 155,116 hectares

$$\text{Annual NH}_3 \text{ emissions from urea application} = (155,116 / 183,302.1) \times 1,590.3 \text{ Mg} = 1,345.8 \text{ Mg}$$

Fertilizer Application							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	728.9
02	Baja California	0.0	0.0	0.0	0.0	0.0	2,006.1
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	413.4
04	Campeche	0.0	0.0	0.0	0.0	0.0	967.7
05	Coahuila	0.0	0.0	0.0	0.0	0.0	795.5
06	Colima	0.0	0.0	0.0	0.0	0.0	989.5
07	Chiapas	0.0	0.0	0.0	0.0	0.0	15,814.2
08	Chihuahua	0.0	0.0	0.0	0.0	0.0	10,117.4
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	226.5
10	Durango	0.0	0.0	0.0	0.0	0.0	3,263.3
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	8,564.2
12	Guerrero	0.0	0.0	0.0	0.0	0.0	4,519.4
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	1,326.9
14	Jalisco	0.0	0.0	0.0	0.0	0.0	11,464.8
15	México	0.0	0.0	0.0	0.0	0.0	6,564.2
16	Michoacán	0.0	0.0	0.0	0.0	0.0	11,819.6
17	Morelos	0.0	0.0	0.0	0.0	0.0	1,473.3
18	Nayarit	0.0	0.0	0.0	0.0	0.0	3,701.0
19	Nuevo León	0.0	0.0	0.0	0.0	0.0	4,073.2
20	Oaxaca	0.0	0.0	0.0	0.0	0.0	5,389.6
21	Puebla	0.0	0.0	0.0	0.0	0.0	7,609.6
22	Querétaro	0.0	0.0	0.0	0.0	0.0	1,275.5
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	456.2
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	1,522.1
25	Sinaloa	0.0	0.0	0.0	0.0	0.0	9,188.0
26	Sonora	0.0	0.0	0.0	0.0	0.0	5,767.3
27	Tabasco	0.0	0.0	0.0	0.0	0.0	960.7
28	Tamaulipas	0.0	0.0	0.0	0.0	0.0	4,143.1
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	2,604.6
30	Veracruz	0.0	0.0	0.0	0.0	0.0	11,159.7
31	Yucatán	0.0	0.0	0.0	0.0	0.0	8,627.9
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	7,434.6
National		0.0	0.0	0.0	0.0	0.0	154,968.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Pesticides

DESCRIPTION:

Volatile organic compound emissions from the active and inert ingredients in pesticides. VOC emissions can occur either during application of pesticides or as a result of evaporation.

POLLUTANTS:

VOC

METHOD:

Emission factors

ACTIVITY DATA:

- Municipality level crop acreage (SAGARPA, 2003a)
- National level pesticide usage (SENER, 2002d)

EMISSION FACTORS:

- VOC emission factors (active ingredients only) – 350 kg/Mg (vapor pressure between 0.0001 mm Hg and 0.000001 mm Hg) and 580 kg/Mg (vapor pressure greater than 0.0001 mm Hg) (EIIP, 2001d)

NOTES AND ASSUMPTIONS:

- Method of pesticide application was assumed to be surface application.
- Average VOC content of inert portion was assumed to be 56% (emulsifiable concentrate) (EIIP, 2001d).
- Emissions only estimated for pesticides used in quantities greater than 200 Mg/year.
- Emissions were not estimated for pesticides that were classified as “other” or that had unknown physical properties (i.e., active and inert fraction, vapor pressure, etc.).
- Pesticide quantities were assumed to be expressed in terms of active ingredient quantities.

SAMPLE CALCULATIONS:

Estimate the total annual emissions from pesticide application in Baja California.

National level emissions:

$$\text{Annual VOC emissions} = \sum(E_{a,p} + E_{i,p}) = \sum([Q_{a,p} \times EF_{a,p}] + [Q_{i,p} \times VOC_f])$$

$E_{a,p}$ = Emissions from pesticide, p, active ingredient (Mg/yr)

$E_{i,p}$ = Emissions from pesticide, p, inert ingredient (Mg/yr)

$Q_{a,p}$ = Quantity of pesticide, p, active ingredient (Mg/yr)

$EF_{a,p}$ = Vapor pressure-based for pesticide, p, active ingredient (kg/Mg)

$Q_{i,p}$ = Quantity of pesticide, p, inert ingredient (Mg/yr)

VOC_f = VOC content in formulation (56%)

Metamidofos – (8,086 Mg active ingredient/year; 40% active and 60% inert; vapor pressure – 0.0008 mm Hg)

$$\text{Emissions} = (8,086 \text{ Mg} \times 580 \text{ kg/Mg}) + (8,086 \text{ Mg} \times [0.60/0.40] \times 0.56) = 4,689.9 \text{ Mg} + 6,792.2 \text{ Mg} = 11,482.1 \text{ Mg}$$

$$\text{Nationwide annual VOC emissions} = \sum(\text{All pesticides}) = 23,562.9 \text{ Mg}$$

State level emissions – Baja California:

Crop acreage in Baja California = 126,631.1 hectares; national crop acreage = 19,266,792 hectares

$$\text{Annual VOC emissions} = (126,631.1/19,266,792) \times 23,562.9 \text{ Mg} = 154.9 \text{ Mg}$$

Municipality level emissions – Mexicali:

Crop acreage in the municipality of Mexicali = 101,443.5 hectares

$$\text{Annual VOC emissions} = (101,443.5/126,631.1) \times 154.9 \text{ Mg} = 124.1 \text{ Mg}$$

Pesticides							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	171.6	0.0	0.0	0.0
02	Baja California	0.0	0.0	154.9	0.0	0.0	0.0
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0
04	Campeche	0.0	0.0	222.5	0.0	0.0	0.0
05	Coahuila	0.0	0.0	240.1	0.0	0.0	0.0
06	Colima	0.0	0.0	180.0	0.0	0.0	0.0
07	Chiapas	0.0	0.0	1,707.3	0.0	0.0	0.0
08	Chihuahua	0.0	0.0	1,039.4	0.0	0.0	0.0
09	Distrito Federal	0.0	0.0	20.0	0.0	0.0	0.0
10	Durango	0.0	0.0	671.6	0.0	0.0	0.0
11	Guanajuato	0.0	0.0	1,231.9	0.0	0.0	0.0
12	Guerrero	0.0	0.0	926.5	0.0	0.0	0.0
13	Hidalgo	0.0	0.0	687.3	0.0	0.0	0.0
14	Jalisco	0.0	0.0	1,789.2	0.0	0.0	0.0
15	México	0.0	0.0	1,032.2	0.0	0.0	0.0
16	Michoacán	0.0	0.0	1,190.1	0.0	0.0	0.0
17	Morelos	0.0	0.0	128.1	0.0	0.0	0.0
18	Nayarit	0.0	0.0	389.1	0.0	0.0	0.0
19	Nuevo León	0.0	0.0	377.8	0.0	0.0	0.0
20	Oaxaca	0.0	0.0	1,180.9	0.0	0.0	0.0
21	Puebla	0.0	0.0	1,010.4	0.0	0.0	0.0
22	Querétaro	0.0	0.0	198.7	0.0	0.0	0.0
23	Quintana Roo	0.0	0.0	149.5	0.0	0.0	0.0
24	San Luis Potosí	0.0	0.0	761.0	0.0	0.0	0.0
25	Sinaloa	0.0	0.0	1,355.6	0.0	0.0	0.0
26	Sonora	0.0	0.0	515.3	0.0	0.0	0.0
27	Tabasco	0.0	0.0	247.5	0.0	0.0	0.0
28	Tamaulipas	0.0	0.0	1,616.2	0.0	0.0	0.0
29	Tlaxcala	0.0	0.0	285.9	0.0	0.0	0.0
30	Veracruz	0.0	0.0	1,763.8	0.0	0.0	0.0
31	Yucatán	0.0	0.0	866.9	0.0	0.0	0.0
32	Zacatecas	0.0	0.0	1,451.7	0.0	0.0	0.0
National		0.0	0.0	23,563.0	0.0	0.0	0.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Beef Cattle Feedlots

DESCRIPTION:

Fugitive dust generated in beef cattle feedlots and stockyards by the movement of cattle over soil dust and dried manure.

POLLUTANTS:

PM₁₀ and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Slaughtered cattle population (INEGI, 2002b)

EMISSION FACTORS:

- PM₁₀ emission factor: 8.62 kg/1,000 head-day (ARB, 2003)

NOTES AND ASSUMPTIONS:

- It was assumed that all slaughtered beef cattle pass through a feedlot and are kept in the feedlot for 120 days prior to slaughter based upon various academic studies.
- Municipality-level slaughter statistics were available for 22 states.
- Rural development district-level slaughter statistics were available for Oaxaca and Sinaloa; district-level slaughter cattle population was allocated to the municipality based on land area (the municipality-to-district assignment was known).
- Rural development district-level slaughter statistics were available for State of México; district-level slaughter cattle population was allocated to municipalities of the same name (the municipality-to-district assignment was not known).
- State-level slaughter statistics were available for Chiapas and Guerrero; state-level cattle population was allocated to municipalities based on land area and then the state-level slaughter fraction was applied to each municipality.
- No slaughter statistics were available for Distrito Federal, Michoacán, Nuevo León, Tamaulipas, and Tlaxcala. The national-level slaughter fraction (0.2423) was applied to municipality-level cattle population for Distrito Federal, Michoacán, Tamaulipas, and Tlaxcala. For Nuevo León, the state-level cattle population was allocated to the municipality-level based on municipality land area and then the national-level slaughter fraction was applied to each municipality.
- The PM_{2.5} particle size fraction of PM₁₀ is 0.1142 (ARB, 2002).

SAMPLE CALCULATIONS:

Estimate the total annual PM₁₀ emissions from beef cattle feedlots in Baja California

State level emissions:

Baja California slaughter cattle population = 208,911

Total PM₁₀ emissions from feedlots = $208,911 \times 8.63 \text{ kg/1,000 head-day} \times 120 \text{ days} = 216.3 \text{ Mg}$

Total PM_{2.5} emissions from feedlots = $216.3 \text{ Mg} \times 0.1142 = 24.7 \text{ Mg}$

Municipality level emissions – Mexicali:

Slaughter cattle population in Mexicali = 162,962

Total PM₁₀ emissions from feedlots = $162,962 \times 8.63 \text{ Mg/1,000 head-day} \times 120 \text{ days} = 168.8 \text{ Mg}$

Total PM_{2.5} emissions from feedlots = $168.8 \text{ Mg} \times 0.1142 = 19.3 \text{ Mg}$

Beef Cattle Feedlots							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	112.4	12.8
02	Baja California	0.0	0.0	0.0	0.0	216.2	24.7
03	Baja California Sur	0.0	0.0	0.0	0.0	24.4	2.8
04	Campeche	0.0	0.0	0.0	0.0	104.4	11.9
05	Coahuila	0.0	0.0	0.0	0.0	205.3	23.5
06	Colima	0.0	0.0	0.0	0.0	38.4	4.4
07	Chiapas	0.0	0.0	0.0	0.0	595.3	68.0
08	Chihuahua	0.0	0.0	0.0	0.0	209.3	23.9
09	Distrito Federal	0.0	0.0	0.0	0.0	5.3	0.6
10	Durango	0.0	0.0	0.0	0.0	296.6	33.9
11	Guanajuato	0.0	0.0	0.0	0.0	206.9	23.6
12	Guerrero	0.0	0.0	0.0	0.0	185.8	21.2
13	Hidalgo	0.0	0.0	0.0	0.0	413.9	47.3
14	Jalisco	0.0	0.0	0.0	0.0	2,480.3	283.3
15	México	0.0	0.0	0.0	0.0	156.8	17.9
16	Michoacán	0.0	0.0	0.0	0.0	507.3	57.9
17	Morelos	0.0	0.0	0.0	0.0	20.2	2.3
18	Nayarit	0.0	0.0	0.0	0.0	128.9	14.7
19	Nuevo León	0.0	0.0	0.0	0.0	94.2	10.8
20	Oaxaca	0.0	0.0	0.0	0.0	210.2	24.0
21	Puebla	0.0	0.0	0.0	0.0	158.9	18.2
22	Querétaro	0.0	0.0	0.0	0.0	119.7	13.7
23	Quintana Roo	0.0	0.0	0.0	0.0	17.4	2.0
24	San Luis Potosí	0.0	0.0	0.0	0.0	169.5	19.4
25	Sinaloa	0.0	0.0	0.0	0.0	309.8	35.4
26	Sonora	0.0	0.0	0.0	0.0	199.0	22.7
27	Tabasco	0.0	0.0	0.0	0.0	279.6	31.9
28	Tamaulipas	0.0	0.0	0.0	0.0	295.1	33.7
29	Tlaxcala	0.0	0.0	0.0	0.0	30.6	3.5
30	Veracruz	0.0	0.0	0.0	0.0	397.2	45.4
31	Yucatán	0.0	0.0	0.0	0.0	133.8	15.3
32	Zacatecas	0.0	0.0	0.0	0.0	67.5	7.7
National		0.0	0.0	0.0	0.0	8,390.2	958.4

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Brick Kilns

DESCRIPTION:

Emissions from this source category result from wood combustion in brick kilns. Wood is the predominant fuel in brick kilns in Mexico.

POLLUTANTS:

NO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Annual brick production in each state (INE, 2000; ETM, 2003)

EMISSION FACTORS:

- NO_x – 4.74 kg/burn; VOC – 61.79 kg/burn; CO – 279.89 kg/burn; and total PM – 44.87 kg/burn (TCEQ, 2002)

NOTES AND ASSUMPTIONS:

- Average number of bricks produced per burn was assumed to be 7,614 (ETM, 2003).
- Particle size fraction for PM₁₀ was assumed to be 0.9350 of total PM (ARB, 2002).
- Particle size fraction for PM_{2.5} was assumed to be 0.9001 of total PM (ARB, 2002).

SAMPLE CALCULATIONS:

Estimate annual emissions from brick kilns in Baja California.

State level emissions – Baja California:

Annual brick production in Baja California = 2,400,000 bricks/year

Average bricks produced per burn = 7,614 bricks/burn

Number of burns = 2,400,000/7,614 = 315.21 burns/year

Annual NO_x emissions = 4.74 kg/burn × 315.21 burns/year = 1,494 kg = 1.5 Mg

Annual VOC emissions = 61.79 kg/burn × 315.21 burns/year = 19,476 kg = 19.5 Mg

Annual CO emissions = 279.89 kg/burn × 315.21 burns/year = 88,221 kg = 88.2 Mg

Annual TSP emissions = 44.87 kg/burn × 315.21 burns/year = 14,143 kg = 14.1 Mg

Annual PM₁₀ emissions = 14.14 Mg × 0.9350 = 13.2 Mg

Annual PM_{2.5} emissions = 14.14 Mg × 0.9001 = 12.7 Mg

Municipality level emissions – Mexicali:

Population of Mexicali = 764,602

Population of Baja California = 2,487,367

Annual NO_x emissions = (764,602/2,487,367) × 1.5 Mg = 0.5 Mg

Annual VOC emissions = (764,602/2,487,367) × 19.5 Mg = 6.0 Mg

Annual CO emissions = (764,602/2,487,367) × 88.2 Mg = 27.1 Mg

Annual PM₁₀ emissions = (764,602/2,487,367) × 13.2 Mg = 4.1 Mg

Annual PM_{2.5} emissions = (764,602/2,487,367) × 12.7 Mg = 3.9 Mg

Brick Kilns							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.4	1.9	0.3	0.3
02	Baja California	1.5	0.0	19.5	88.2	13.2	12.7
03	Baja California Sur	1.8	0.0	23.7	107.4	16.1	15.5
04	Campeche	0.0	0.0	0.0	0.0	0.0	0.0
05	Coahuila	0.6	0.0	7.8	35.3	5.3	5.1
06	Colima	2.3	0.0	30.3	137.2	20.6	19.8
07	Chiapas	16.8	0.0	219.6	994.6	149.1	143.5
08	Chihuahua	26.1	0.0	339.8	1,539.1	230.7	222.1
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	6.2	0.0	81.0	366.8	55.0	52.9
11	Guanajuato	20.0	0.0	260.8	1,181.4	177.1	170.5
12	Guerrero	13.2	0.0	172.2	780.2	116.9	112.6
13	Hidalgo	9.6	0.0	125.0	566.1	84.9	81.7
14	Jalisco	27.2	0.0	354.0	1,603.7	240.4	231.4
15	México	205.0	0.0	2,672.1	12,103.6	1,814.2	1,746.5
16	Michoacán	8.6	0.0	112.2	508.1	76.2	73.3
17	Morelos	6.7	0.0	87.0	394.0	59.1	56.8
18	Nayarit	4.0	0.0	51.5	233.3	35.0	33.7
19	Nuevo León	2.6	0.0	33.6	152.2	22.8	22.0
20	Oaxaca	14.7	0.0	192.2	870.7	130.5	125.6
21	Puebla	115.2	0.0	1,501.3	6,800.6	1,019.4	981.3
22	Querétaro	24.9	0.0	324.6	1,470.4	220.4	212.2
23	Quintana Roo	3.8	0.0	48.9	221.7	33.2	32.0
24	San Luis Potosí	9.9	0.0	128.6	582.6	87.3	84.1
25	Sinaloa	10.9	0.0	142.0	643.1	96.4	92.8
26	Sonora	0.4	0.0	4.9	22.1	3.3	3.2
27	Tabasco	8.1	0.0	105.8	479.3	71.8	69.2
28	Tamaulipas	0.6	0.0	7.8	35.3	5.3	5.1
29	Tlaxcala	4.1	0.0	53.9	244.0	36.6	35.2
30	Veracruz	10.8	0.0	140.2	635.2	95.2	91.7
31	Yucatán	56.9	0.0	742.1	3,361.3	503.8	485.0
32	Zacatecas	5.8	0.0	75.7	342.8	51.4	49.5
National		618.3	0.0	8,058.5	36,502.2	5,471.5	5,267.3
							0.0

Activity Data Rating: D

Emission Factor Rating: B

Overall Rating: D

Date: April 5, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Street Vendors – Charbroiling

DESCRIPTION:

Emissions from charbroiling of meat.

POLLUTANTS:

NO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Per capita emission factors derived from previous street vendor study in Ciudad Juárez, Chihuahua.

ACTIVITY DATA:

- Population (INEGI, 2000a)

EMISSION FACTORS:

- Per capita emission factors calculated from previous street vendor study in Ciudad Juárez : NO_x – 2.93 kg/1000 people; VOC – 10.27 kg/1000 people; CO – 159.17 kg/1000 people; PM₁₀ – 79.95 kg/1000 people; and PM_{2.5} – 63.81 kg/1000 people (CICA, 1999; ERG, 2003f)
- LPG usage: chicken, lamb, and/or pork – VOC: 1.8 g/kg of meat; PM₁₀: 10.4 g/kg of meat (CICA, 1999)

NOTES AND ASSUMPTIONS:

- PM_{2.5} particle size fraction is 0.7981 of PM₁₀ (CICA, 1999).
- National emissions derived by extrapolating Ciudad Juárez emissions inventory results (ERG, 2003f).

SAMPLE CALCULATIONS:

Estimate annual emissions from charbroiling of meat by street vendors in Baja California.

National level emissions:

Total NO_x emissions in Ciudad Juárez = 3,576 Mg/year

Population of Juárez = 1,218,817

Population of Mexico = 97,483,412

Extrapolated national level NO_x emissions = (97,483,412/1,218,817) × 3,576 Mg = 286.0 Mg

State level emissions:

Baja California population = 2,487,367

NO_x emissions = 287.8 Mg/year × (2,487,367/97,483,412) = 7.3 Mg

Municipality level emissions – Mexicali:

Mexicali population = 764,602

NO_x emissions = 7.3 Mg × (764,602/2,487,367) = 2.2 Mg

Street Vendors – Charbroiling							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	2.8	0.0	9.7	150.3	75.5	60.3
02	Baja California	7.3	0.0	25.5	395.9	198.9	158.7
03	Baja California Sur	1.2	0.0	4.4	67.5	33.9	27.1
04	Campeche	2.0	0.0	7.1	109.9	55.2	44.1
05	Coahuila	6.7	0.0	23.6	365.8	183.7	146.6
06	Colima	1.6	0.0	5.6	86.4	43.4	34.6
07	Chiapas	11.5	0.0	40.3	624.1	313.5	250.2
08	Chihuahua	9.0	0.0	31.4	485.9	244.1	194.8
09	Distrito Federal	25.2	0.0	88.4	1,369.7	688.0	549.1
10	Durango	4.3	0.0	14.9	230.6	115.8	92.4
11	Guanajuato	13.7	0.0	47.9	742.2	372.8	297.6
12	Guerrero	9.0	0.0	31.6	490.2	246.2	196.5
13	Hidalgo	6.6	0.0	23.0	355.8	178.7	142.7
14	Jalisco	18.5	0.0	64.9	1,006.3	505.5	403.4
15	México	38.4	0.0	134.5	2,084.6	1,047.1	835.8
16	Michoacán	11.7	0.0	40.9	634.4	318.7	254.3
17	Morelos	4.6	0.0	16.0	247.6	124.3	99.3
18	Nayarit	2.7	0.0	9.4	146.5	73.6	58.7
19	Nuevo León	11.2	0.0	39.4	610.3	306.5	244.7
20	Oaxaca	10.1	0.0	35.3	547.3	274.9	219.4
21	Puebla	14.9	0.0	52.1	808.1	405.9	324.0
22	Querétaro	4.1	0.0	14.4	223.5	112.3	89.6
23	Quintana Roo	2.6	0.0	9.0	139.3	70.0	55.8
24	San Luis Potosí	6.7	0.0	23.6	366.0	183.8	146.7
25	Sinaloa	7.4	0.0	26.1	403.8	202.8	161.9
26	Sonora	6.5	0.0	22.8	352.9	177.2	141.5
27	Tabasco	5.6	0.0	19.4	301.1	151.3	120.7
28	Tamaulipas	8.1	0.0	28.3	438.2	220.1	175.7
29	Tlaxcala	2.8	0.0	9.9	153.2	77.0	61.4
30	Veracruz	20.3	0.0	70.9	1,099.7	552.4	440.9
31	Yucatán	4.9	0.0	17.0	263.9	132.6	105.8
32	Zacatecas	4.0	0.0	13.9	215.5	108.2	86.4
National		286.0	0.0	1,001.2	15,516.5	7,793.9	6,220.7
							0.0

Activity Data Rating: D

Emission Factor Rating: B

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE:	Area	SOURCE CATEGORY:	Open Burning - Waste
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DESCRIPTION:

This category includes emissions resulting from open burning of solid municipal residential waste. This category does not include agricultural burning and confined burning of solid waste.

POLLUTANTS:

NO_x, SO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Waste quantity burned (García Gutiérrez et al., 2001)
- Combustible content in waste (García Gutiérrez et al., 2001)

EMISSION FACTORS:

- NO_x – 3 kg/Mg waste; SO_x – 0.5 kg/Mg waste; VOC – 4.278 kg/Mg waste; CO – 42.5 kg/Mg waste; PM₁₀ – 19 kg/Mg waste; and PM_{2.5} – 17.4 kg/Mg waste (EIIP, 2001e)

NOTES AND ASSUMPTIONS:

- The identified state-level burned waste quantities included cardboard, fine wastes, rubber, paper, plastic film, hard plastic, garden wastes, and rags. These quantities were adjusted to account for the “other waste” category. The non-combustible portion of waste included bone, cans, ferrous and non-ferrous metals, food wastes, colored glass, and transparent glass.
- Waste compositions were developed for five different zones: Frontier North (Baja California, Coahuila, Chihuahua, Nuevo León, Sonora, and Tamaulipas); North (Aguascalientes, Baja California Sur, Colima, Durango, Jalisco, Nayarit, San Luis Potosí, Sinaloa, and Zacatecas); South (Campeche, Chiapas, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán); Central (Guanajuato, Guerrero, Hidalgo, Michoacán, Morelos, Puebla, Querétaro, and Tlaxcala); and DF (Distrito Federal and State of México).

SAMPLE CALCULATIONS:

Estimate annual emissions from open burning of solid waste in Baja California.

Identified waste quantity burned = 24,363 Mg/yr (43.51% of combustibles)

Revised combustible fraction to include “other wastes” (61.56%) for Frontier North zone

Revised waste quantity burned $24,363 \times (0.6156/0.4351) = 34,469.9 \text{ Mg/yr}$

State level emissions – Baja California:

Annual NO_x emissions = 3 kg/Mg × 34,469.9 Mg = 103,410 kg = 103.4 Mg

Annual SO_x emissions = 0.5 kg/Mg × 34,469.9 Mg = 17,235 kg = 17.2 Mg

Annual VOC emissions = 4.278 kg/Mg × 34,469.9 Mg = 147,462 kg = 147.5 Mg

Annual CO emissions = 42.5 kg/Mg × 34,469.9 Mg = 1,464,971 kg = 1,465.0 Mg

Annual PM₁₀ emissions = 19 kg/Mg × 34,469.9 Mg = 654,928 kg = 654.9 Mg

Annual PM_{2.5} emissions = 17.4 kg/Mg × 34,469.9 Mg = 599,776 kg = 599.8 Mg

Municipality Level Emissions – Mexicali:

Population of Baja California = 2,487,367; population of Mexicali = 764,602

Annual NO_x emissions = 103.4 Mg × (764,602/2,487,367) = 31.8 Mg

Annual SO_x emissions = 17.2 Mg × (764,602/2,487,367) = 5.3 Mg

Annual VOC emissions = 147.5 Mg × (764,602/2,487,367) = 45.3 Mg

Annual CO emissions = 1,465.0 Mg × (764,602/2,487,367) = 450.3 Mg

Annual PM₁₀ emissions = 654.9 Mg × (764,602/2,487,367) = 201.3 Mg

Annual PM_{2.5} emissions = 599.8 Mg × (764,602/2,487,367) = 184.4 Mg

Open Burning – Waste							
State Code	State Name	Annual Emissions (Mg/yr)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	39.6	6.6	56.5	561.7	251.1	230.0
02	Baja California	103.4	17.2	147.5	1,465.0	654.9	599.8
03	Baja California Sur	17.8	3.0	25.4	252.1	112.7	103.2
04	Campeche	32.4	5.4	46.2	458.8	205.1	187.8
05	Coahuila	95.4	15.9	136.1	1,352.0	604.4	553.5
06	Colima	22.7	3.8	32.4	321.9	143.9	131.8
07	Chiapas	184.1	30.7	262.5	2,608.1	1,166.0	1,067.8
08	Chihuahua	126.7	21.1	180.7	1,794.9	802.4	734.8
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	60.8	10.1	86.6	860.8	384.8	352.4
11	Guanajuato	186.8	31.1	266.4	2,646.9	1,183.3	1,083.7
12	Guerrero	123.4	20.6	175.9	1,747.9	781.4	715.6
13	Hidalgo	89.5	14.9	127.7	1,268.3	567.0	519.3
14	Jalisco	265.6	44.3	378.8	3,763.1	1,682.3	1,540.7
15	México	0.0	0.0	0.0	0.0	0.0	0.0
16	Michoacán	159.7	26.6	227.7	2,261.8	1,011.1	926.0
17	Morelos	62.3	10.4	88.8	882.7	394.6	361.4
18	Nayarit	38.6	6.4	55.1	547.5	244.8	224.2
19	Nuevo León	159.1	26.5	226.8	2,253.2	1,007.3	922.5
20	Oaxaca	161.2	26.9	229.8	2,283.2	1,020.7	934.8
21	Puebla	203.4	33.9	290.1	2,882.0	1,288.4	1,179.9
22	Querétaro	56.3	9.4	80.2	796.9	356.3	326.3
23	Quintana Roo	41.0	6.8	58.5	581.3	259.9	238.0
24	San Luis Potosí	96.5	16.1	137.6	1,367.0	611.1	559.7
25	Sinaloa	106.5	17.8	151.9	1,509.0	674.6	617.8
26	Sonora	92.0	15.3	131.2	1,303.5	582.7	533.7
27	Tabasco	88.7	14.8	126.5	1,256.9	561.9	514.6
28	Tamaulipas	114.2	19.0	162.8	1,617.8	723.2	662.3
29	Tlaxcala	38.6	6.4	55.0	546.7	244.4	223.8
30	Veracruz	324.1	54.0	462.1	4,590.8	2,052.4	1,879.5
31	Yucatán	77.7	13.0	110.9	1,101.4	492.4	450.9
32	Zacatecas	56.8	9.5	81.0	804.4	359.6	329.3
National		3,224.9	537.5	4,598.7	45,687.6	20,424.7	18,705.1
							0.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Wildfires

DESCRIPTION:

This category includes forest fires, brush fires, intentional fires, and naturally occurring fires. Emissions are caused by the combustion of biomass.

POLLUTANTS:

NO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Burned acreage per year (INEGI, 2001)
- Distribution of forest types (García Gutiérrez et al., 2001)
- Fuel loading (biomass burned) (García Gutiérrez et al., 2001)

EMISSION FACTORS:

- NO_x – 2 kg/Mg biomass; VOC – 12 kg/Mg biomass; CO – 70 kg/Mg biomass; and total PM – 8.5 kg/Mg biomass (U.S. EPA, 1995 [Section 13.1 – Updated October 1996])

NOTES AND ASSUMPTIONS:

- Particle size fraction for PM₁₀ = 0.961 of total PM (ARB, 2002).
- Particle size distribution for PM_{2.5} = 0.8544 of total PM (ARB, 2002).

SAMPLE CALCULATIONS:

Estimate annual emissions from wildfires in Baja California.

Municipality level emissions – Ensenada:

Area of pastures burned = 358.85 hectares/year; Area of brushwood burned = 791.52 hectares/year

Area of forests (woodland and reforested) burned = 5.05 hectares/year

Forest distribution in Baja California = conifers (100%)

Fuel loading:

Fuel loading from pasture = 1.5 Mg/hectare × 358.85 hectares = 538.3 Mg

Fuel loading from brushwood = 5 Mg/hectare × 791.52 hectares = 3,957.6 Mg

Fuel loading from coniferous forest = 120 Mg/hectare × 5.05 hectares = 606.0 Mg

Total fuel loading = 538.3 + 3,957.6 + 606 = 5,101.9 Mg

Annual NO_x emissions = 2 kg/Mg × 5,101.9 Mg = 10,203 kg = 10.2 Mg

Annual VOC emissions = 12 kg/Mg × 5,101.9 Mg = 61,222 kg = 61.2 Mg

Annual CO emissions = 70 kg/Mg × 5,101.9 Mg = 357,133 kg = 357.1 Mg

Annual PM₁₀ emissions = 8.5 kg/Mg × 0.961 × 5,101.9 Mg = 41,674 kg = 41.7 Mg

Annual PM_{2.5} emissions = 8.5 kg/Mg × 0.8544 × 5,101.9 Mg = 37,052 kg = 37.1 Mg

State level emissions – Baja California:

Annual emissions = Emissions (Ensenada + Mexicali + Tecate + Tijuana + Playas de Rosarito)

Annual NO_x emissions = 10.2 Mg + 0.0 Mg + 5.6 Mg + 1.2 Mg + 0.7 Mg = 17.7 Mg

Annual VOC emissions = 61.2 Mg + 0.0 Mg + 33.6 Mg + 7.2 Mg + 4.2 Mg = 106.2 Mg

Annual CO emissions = 357.1 Mg + 0.0 Mg + 195.7 Mg + 41.9 Mg + 24.6 Mg = 619.3 Mg

Annual PM₁₀ emissions = 41.7 Mg + 0.0 Mg + 22.8 Mg + 4.9 Mg + 2.9 Mg = 72.3 Mg

Annual PM_{2.5} emissions = 37.1 Mg + 0.0 Mg + 20.3 Mg + 4.3 Mg + 2.6 Mg = 64.3 Mg

Wildfires								
State Code	State Name	Annual Emissions (Mg/year)						
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
01	Aguascalientes	0.6	0.0	3.8	21.9	2.6	2.3	0.0
02	Baja California	17.7	0.0	106.2	619.4	72.3	64.3	0.0
03	Baja California Sur	0.5	0.0	2.8	16.2	1.9	1.7	0.0
04	Campeche	377.3	0.0	2,263.5	13,203.9	1,540.8	1,369.9	0.0
05	Coahuila	23.8	0.0	142.8	833.2	97.2	86.4	0.0
06	Colima	20.8	0.0	124.6	726.7	84.8	75.4	0.0
07	Chiapas	1,421.0	0.0	8,526.1	49,735.4	5,803.8	5,160.0	0.0
08	Chihuahua	171.5	0.0	1,029.3	6,004.2	700.6	622.9	0.0
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Durango	350.5	0.0	2,102.8	12,266.1	1,431.4	1,272.6	0.0
11	Guanajuato	18.7	0.0	112.3	655.0	76.4	68.0	0.0
12	Guerrero	386.2	0.0	2,317.0	13,515.7	1,577.2	1,402.2	0.0
13	Hidalgo	18.6	0.0	111.5	650.3	75.9	67.5	0.0
14	Jalisco	559.9	0.0	3,359.3	19,595.9	2,286.7	2,033.0	0.0
15	México	74.8	0.0	448.9	2,618.4	305.5	271.7	0.0
16	Michoacán	681.8	0.0	4,090.6	23,861.9	2,784.5	2,475.6	0.0
17	Morelos	5.7	0.0	34.0	198.0	23.1	20.5	0.0
18	Nayarit	126.1	0.0	756.4	4,412.2	514.9	457.8	0.0
19	Nuevo León	5.6	0.0	33.9	197.6	23.1	20.5	0.0
20	Oaxaca	961.2	0.0	5,767.3	33,642.8	3,925.9	3,490.4	0.0
21	Puebla	60.1	0.0	360.4	2,102.6	245.4	218.1	0.0
22	Querétaro	3.9	0.0	23.3	135.9	15.9	14.1	0.0
23	Quintana Roo	85.8	0.0	514.6	3,002.1	350.3	311.5	0.0
24	San Luis Potosí	96.0	0.0	576.1	3,360.9	392.2	348.7	0.0
25	Sinaloa	12.3	0.0	74.0	431.4	50.3	44.8	0.0
26	Sonora	38.4	0.0	230.4	1,343.9	156.8	139.4	0.0
27	Tabasco	26.8	0.0	160.9	938.3	109.5	97.3	0.0
28	Tamaulipas	9.2	0.0	55.3	322.7	37.7	33.5	0.0
29	Tlaxcala	141.0	0.0	846.1	4,935.3	575.9	512.0	0.0
30	Veracruz	9.8	0.0	59.0	344.0	40.1	35.7	0.0
31	Yucatán	96.5	0.0	579.2	3,378.7	394.3	350.5	0.0
32	Zacatecas	140.3	0.0	841.7	4,910.1	573.0	509.4	0.0
National		5,942.4	0.0	35,654.1	207,980.7	24,270.0	21,577.7	0.0

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area **SOURCE CATEGORY:** Structure Fires

DESCRIPTION:

Structure fires include the unintentional burning of the structure material and building contents.

POLLUTANTS:

NO_x, VOC, CO, PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Housing data (INEGI, 2000a)

EMISSION FACTORS:

- NO_x – 2.0 kg/Mg (Radian, 1997; EIIP, 2001f)
- VOC – 5.21 kg/Mg (Radian, 1997; EIIP, 2001f)
- CO – 84.0 kg/Mg (Radian, 1997; EIIP, 2001f)
- PM₁₀ – 5.29 kg/Mg (Radian, 1997; EIIP, 2001f)
- PM_{2.5} – 4.94 kg/Mg (Radian, 1997; EIIP, 2001f)

NOTES AND ASSUMPTIONS:

- Number of fires per 1,000 houses = 0.57 (average value calculated for 19 states; INEGI, 2001).
- Average content loss was assumed to be 7.3% (Radian, 1997; EIIP, 2001f).
- Average amount of combustible contents in the structure was assumed to be 38.62 kg/m² (Radian, 1997; EIIP, 2001f).
- Average area of a structure was assumed to be 100 m².
- Only residential building fires were considered.
- Combustible building material was assumed to be 0 Mg (masonry construction) (GDF, 2004).
- PM₁₀ size fraction of total PM = 0.9800; PM_{2.5} size fraction of PM₁₀ = 0.9327 (ARB, 2002).

SAMPLE CALCULATIONS:

Estimate the total annual emissions from structure fires in Baja California.

State level emissions:

Number of houses in the state of Baja California = 610,057

Number of fires = (610,057/1,000) × 0.57 = 348

Total combustible material = number of fires × structural loss × (combustible building material + combustible building contents) = 348 × (0.073) × (0 + 100 m² × 38.62 kg/m²) = 98.1 Mg

Annual NO_x emissions = 98.1 Mg × 2.0 kg/Mg = 196 kg = 0.2 Mg

Municipality Level emissions – Mexicali:

Number of houses in the municipality of Mexicali = 190,426

Number of fires = (190,426/1000) × 0.57 = 109

Total combustible material = 109 × 0.073 × (0 + 100 m² × 38.62 kg/m²) = 30.6 Mg

Annual NO_x emissions = 30.6 Mg × 2.0 kg/Mg = 61 kg = 0.06 Mg

Structure Fires							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.1	0.0	0.2	2.7	0.2	0.2
02	Baja California	0.2	0.0	0.5	8.2	0.5	0.5
03	Baja California Sur	0.0	0.0	0.1	1.4	0.1	0.1
04	Campeche	0.2	0.0	0.5	7.6	0.5	0.4
05	Coahuila	0.2	0.0	0.5	7.3	0.5	0.4
06	Colima	0.0	0.0	0.1	1.8	0.1	0.1
07	Chiapas	0.3	0.0	0.7	10.8	0.7	0.6
08	Chihuahua	0.2	0.0	0.6	10.2	0.6	0.6
09	Distrito Federal	0.7	0.0	1.8	28.7	1.8	1.7
10	Durango	0.1	0.0	0.3	4.4	0.3	0.3
11	Guanajuato	0.3	0.0	0.8	12.5	0.8	0.7
12	Guerrero	0.2	0.0	0.5	8.8	0.6	0.5
13	Hidalgo	0.2	0.0	0.4	6.6	0.4	0.4
14	Jalisco	0.4	0.0	1.2	18.7	1.2	1.1
15	México	0.9	0.0	2.4	38.9	2.5	2.3
16	Michoacán	0.3	0.0	0.7	11.5	0.7	0.7
17	Morelos	0.1	0.0	0.3	4.9	0.3	0.3
18	Nayarit	0.1	0.0	0.2	2.9	0.2	0.2
19	Nuevo León	0.3	0.0	0.7	11.9	0.8	0.7
20	Oaxaca	0.2	0.0	0.6	10.0	0.6	0.6
21	Puebla	0.3	0.0	0.9	14.3	0.9	0.8
22	Querétaro	0.1	0.0	0.2	4.0	0.3	0.2
23	Quintana Roo	0.1	0.0	0.2	2.9	0.2	0.2
24	San Luis Potosí	0.2	0.0	0.4	6.6	0.4	0.4
25	Sinaloa	0.2	0.0	0.5	7.7	0.5	0.5
26	Sonora	0.2	0.0	0.4	7.1	0.4	0.4
27	Tabasco	0.1	0.0	0.3	5.5	0.3	0.3
28	Tamaulipas	0.2	0.0	0.6	9.2	0.6	0.5
29	Tlaxcala	0.1	0.0	0.2	2.6	0.2	0.2
30	Veracruz	0.5	0.0	1.3	21.6	1.4	1.3
31	Yucatán	0.1	0.0	0.3	5.0	0.3	0.3
32	Zacatecas	0.1	0.0	0.2	4.0	0.3	0.2
National		7.2	0.0	18.6	300.3	19.2	17.7

Activity Data Rating: C

Emission Factor Rating: D

Overall Rating: D

Date: April 7, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Construction Activities

DESCRIPTION:

Building, road and other construction activities are a potentially significant source of fugitive PM emissions. Construction activities also include land clearing, drilling, blasting, ground excavation, earth moving, etc.

POLLUTANTS:

PM₁₀, and PM_{2.5}

METHOD:

Emission factors

ACTIVITY DATA:

- Construction permit data (INEGI, 2002b)

EMISSION FACTORS:

- PM₁₀ – 0.941 Mg/hectare-month (MRI, 1996)

NOTES AND ASSUMPTIONS:

- PM_{2.5} size fraction of PM₁₀ is 0.20785 (ARB, 2002).
- INEGI construction permit data were unavailable for Baja California, Coahuila, Hidalgo, State of México, Michoacán, Nayarit, Nuevo León, Puebla, Querétaro, Quintana Roo, San Luis Potosí, Sonora, Tamaulipas, Tlaxcala, Yucatán, and Zacatecas. Permit data from the other states were extrapolated to municipalities with a population of 100,000 or greater within these 16 states without data.
- No municipality with a population of 100,000 or greater is located in the state of Tlaxcala, so there are zero emissions.
- Average areas for construction sites were assumed based on typical areas used in Mexico construction cost statistics.
- Average area for a residential construction site was assumed to be 0.01 hectares (100 m²).
- Average area for commercial and service sector construction site was assumed to be 0.486 hectares (4,860 m²).
- Average area for an industrial construction site was assumed to be 0.176 hectares (1,760 m²).
- Average duration for residential construction was assumed to be 1 month.
- Average duration for all other types of construction was assumed to be 2 months.

SAMPLE CALCULATIONS:

Estimate total annual emissions from residential construction activities.

State level emissions – Chihuahua:

Number of permits for residential construction = 9,860

Total area of construction = 9,860 × 0.01 hectares = 98.6 hectares

PM₁₀ emissions = (98.6 hectares × 0.941 Mg/hectare-month × 1 month) = 92.8 Mg

PM_{2.5} emissions = 92.8 Mg × 0.20785 = 19.3 Mg

Municipality Level emissions – Ciudad Juárez:

Number of permits for residential construction in Ciudad Juárez = 5,125

Total area of construction = 5,125 × 0.01 hectares = 51.25 hectares

PM₁₀ emissions = (51.25 hectares × 0.941 Mg/hectare-month × 1 month) = 48.2 Mg

PM_{2.5} emissions = 48.2 Mg × 0.20785 = 10.0 Mg

Construction Activities							
State Code	State Name	Annual Emissions (Mg/year)					
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}
01	Aguascalientes	0.0	0.0	0.0	0.0	524.5	109.0
02	Baja California	0.0	0.0	0.0	0.0	338.1	70.3
03	Baja California Sur	0.0	0.0	0.0	0.0	216.8	45.1
04	Campeche	0.0	0.0	0.0	0.0	102.1	21.2
05	Coahuila	0.0	0.0	0.0	0.0	221.9	46.1
06	Colima	0.0	0.0	0.0	0.0	263.8	54.8
07	Chiapas	0.0	0.0	0.0	0.0	162.8	33.8
08	Chihuahua	0.0	0.0	0.0	0.0	877.3	182.3
09	Distrito Federal	0.0	0.0	0.0	0.0	173.9	36.1
10	Durango	0.0	0.0	0.0	0.0	327.5	68.1
11	Guanajuato	0.0	0.0	0.0	0.0	0.3	0.1
12	Guerrero	0.0	0.0	0.0	0.0	225.8	46.9
13	Hidalgo	0.0	0.0	0.0	0.0	68.6	14.3
14	Jalisco	0.0	0.0	0.0	0.0	919.8	191.2
15	México	0.0	0.0	0.0	0.0	1,412.9	293.7
16	Michoacán	0.0	0.0	0.0	0.0	228.0	47.4
17	Morelos	0.0	0.0	0.0	0.0	247.0	51.3
18	Nayarit	0.0	0.0	0.0	0.0	44.0	9.1
19	Nuevo León	0.0	0.0	0.0	0.0	453.7	94.3
20	Oaxaca	0.0	0.0	0.0	0.0	821.9	170.8
21	Puebla	0.0	0.0	0.0	0.0	261.1	54.3
22	Querétaro	0.0	0.0	0.0	0.0	118.3	24.6
23	Quintana Roo	0.0	0.0	0.0	0.0	90.5	18.8
24	San Luis Potosí	0.0	0.0	0.0	0.0	143.8	29.9
25	Sinaloa	0.0	0.0	0.0	0.0	164.6	34.2
26	Sonora	0.0	0.0	0.0	0.0	222.2	46.2
27	Tabasco	0.0	0.0	0.0	0.0	221.1	46.0
28	Tamaulipas	0.0	0.0	0.0	0.0	322.1	66.9
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0
30	Veracruz	0.0	0.0	0.0	0.0	111.5	23.2
31	Yucatán	0.0	0.0	0.0	0.0	101.6	21.1
32	Zacatecas	0.0	0.0	0.0	0.0	60.0	12.5
National		0.0	0.0	0.0	0.0	9,447.5	1,963.6

Activity Data Rating: C

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

SOURCE TYPE: Area

SOURCE CATEGORY: Domestic Ammonia

DESCRIPTION:

Various domestic ammonia emissions – pet waste (dogs and cats), human respiration and perspiration, household ammonia use, cigarette smoke, diapers (cloth and disposable), and untreated human waste.

POLLUTANTS:

NH₃

METHOD:

Per capita emission factors

ACTIVITY DATA:

- Population (INEGI, 2000a)
- Infant population (< 3 yrs) (INEGI, 2000a)
- Pet ratios (Radian, 1997)

EMISSION FACTORS:

- Dogs – 2.49 kg/head-year; cats – 0.82 kg/head-year; cigarettes – 5.2 mg/cigarette; human perspiration – 0.25 kg/person-year; human respiration – 0.0016 kg/person-year; household ammonia use – 0.023 kg/person-year; diapers (cloth) – 3.13 kg/infant-year; diapers (disposable) – 0.16 kg/infant-year; human waste (homeless) – 4.99 kg/person-year; and human waste (other) – 0.023 kg/person-year (Radian, 1997)

NOTES AND ASSUMPTIONS:

- Dog ratios (animals/1,000 people) – 122 (urban); 167 (suburban); 220 (rural) (Radian, 1997).
- Cat ratios (animals/1,000 people) – 83 (urban); 111 (suburban); 133 (rural) (Radian, 1997).
- Urban areas (>800,000 people), suburban (200,000-800,000 people), rural (<200,000).
- 15% of the population smokes, with each individual smoking 20 cigarettes every day.
- Diaper use is 55% disposable diapers and 45% cloth diapers (Richer, 2003).
- 1% of the population is homeless.

SAMPLE CALCULATIONS:

Estimate the total annual domestic ammonia emissions in Baja California.

Municipality level emissions – Mexicali:

Annual domestic ammonia emissions in Mexicali (764,602 population):

$$\text{Dogs} = 764,602 \text{ people} \times (167 \text{ dogs}/1,000 \text{ people}) \times 2.49 \text{ kg NH}_3/\text{dog-year} = 317,944 \text{ kg} = 317.9 \text{ Mg}$$

$$\text{Cats} = 764,602 \text{ people} \times (111 \text{ cats}/1,000 \text{ people}) \times 0.82 \text{ kg NH}_3/\text{cat-year} = 69,594 \text{ kg} = 69.6 \text{ Mg}$$

$$\text{Cigarette smoke} = 764,602 \text{ people} \times 0.15 \times 20 \text{ cigarettes/day} \times 365 \times 5.2 \text{ mg/cigarette} = 4,354 \text{ kg} = 4.4 \text{ Mg}$$

$$\text{Perspiration} = 764,602 \text{ people} \times 0.25 \text{ kg NH}_3/\text{person-year} = 191,150 \text{ kg} = 191.2 \text{ Mg}$$

$$\text{Respiration} = 764,602 \text{ people} \times 0.0016 \text{ kg NH}_3/\text{person-year} = 1,223 \text{ kg} = 1.2 \text{ Mg}$$

$$\text{Household ammonia use} = 764,602 \text{ people} \times 0.023 \text{ kg NH}_3/\text{person-year} = 17,586 \text{ kg} = 17.6 \text{ Mg}$$

$$\text{Cloth diapers} = 764,602 \text{ people} \times 0.0635 \times 0.45 \times 3.13 \text{ kg NH}_3/\text{infant-year} = 68,386 \text{ kg} = 68.4 \text{ Mg}$$

$$\text{Disposable diapers} = 764,602 \text{ people} \times 0.0635 \times 0.55 \times 0.16 \text{ kg NH}_3/\text{infant-year} = 4,273 \text{ kg} = 4.3 \text{ Mg}$$

$$\text{Human waste (homeless)} = 764,602 \text{ people} \times 0.01 \times 4.99 \text{ kg NH}_3/\text{person-year} = 38,154 \text{ kg} = 38.2 \text{ Mg}$$

$$\text{Human waste (other)} = 764,602 \text{ people} \times 0.99 \times 0.023 \text{ kg NH}_3/\text{person-year} = 17,410 \text{ kg} = 17.4 \text{ Mg}$$

$$\text{Total emissions in Mexicali} = 317.9 + 69.6 + 4.4 + 191.2 + 1.2 + 17.6 + 68.4 + 4.3 + 38.2 + 17.4 = 730.2 \text{ Mg}$$

State level emissions:

$$\begin{aligned}\text{Total emissions in Baja California} &= \text{Emissions (Ensenada} + \text{Mexicali} + \text{Tecate} + \text{Tijuana} + \text{Playas de Rosarito)} \\ &= 354.0 + 730.2 + 86.0 + 992.7 + 70.1 = 2,233.0 \text{ Mg}\end{aligned}$$

Domestic Ammonia								
State Code	State Name	Annual Emissions (Mg/year)						
		NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	
01	Aguascalientes	0.0	0.0	0.0	0.0	0.0	0.0	946.8
02	Baja California	0.0	0.0	0.0	0.0	0.0	0.0	2,232.7
03	Baja California Sur	0.0	0.0	0.0	0.0	0.0	0.0	468.5
04	Campeche	0.0	0.0	0.0	0.0	0.0	0.0	730.6
05	Coahuila	0.0	0.0	0.0	0.0	0.0	0.0	2,372.9
06	Colima	0.0	0.0	0.0	0.0	0.0	0.0	599.5
07	Chiapas	0.0	0.0	0.0	0.0	0.0	0.0	4,226.1
08	Chihuahua	0.0	0.0	0.0	0.0	0.0	0.0	2,924.8
09	Distrito Federal	0.0	0.0	0.0	0.0	0.0	0.0	7,847.6
10	Durango	0.0	0.0	0.0	0.0	0.0	0.0	1,485.8
11	Guanajuato	0.0	0.0	0.0	0.0	0.0	0.0	4,671.0
12	Guerrero	0.0	0.0	0.0	0.0	0.0	0.0	3,294.2
13	Hidalgo	0.0	0.0	0.0	0.0	0.0	0.0	2,433.2
14	Jalisco	0.0	0.0	0.0	0.0	0.0	0.0	6,108.6
15	México	0.0	0.0	0.0	0.0	0.0	0.0	12,661.6
16	Michoacán	0.0	0.0	0.0	0.0	0.0	0.0	4,270.6
17	Morelos	0.0	0.0	0.0	0.0	0.0	0.0	1,667.6
18	Nayarit	0.0	0.0	0.0	0.0	0.0	0.0	970.9
19	Nuevo León	0.0	0.0	0.0	0.0	0.0	0.0	3,632.8
20	Oaxaca	0.0	0.0	0.0	0.0	0.0	0.0	3,760.9
21	Puebla	0.0	0.0	0.0	0.0	0.0	0.0	5,191.1
22	Querétaro	0.0	0.0	0.0	0.0	0.0	0.0	1,455.3
23	Quintana Roo	0.0	0.0	0.0	0.0	0.0	0.0	872.5
24	San Luis Potosí	0.0	0.0	0.0	0.0	0.0	0.0	2,439.9
25	Sinaloa	0.0	0.0	0.0	0.0	0.0	0.0	2,538.4
26	Sonora	0.0	0.0	0.0	0.0	0.0	0.0	2,304.5
27	Tabasco	0.0	0.0	0.0	0.0	0.0	0.0	1,979.5
28	Tamaulipas	0.0	0.0	0.0	0.0	0.0	0.0	2,785.7
29	Tlaxcala	0.0	0.0	0.0	0.0	0.0	0.0	1,063.6
30	Veracruz	0.0	0.0	0.0	0.0	0.0	0.0	7,466.1
31	Yucatán	0.0	0.0	0.0	0.0	0.0	0.0	1,726.3
32	Zacatecas	0.0	0.0	0.0	0.0	0.0	0.0	1,495.5
National		0.0	0.0	0.0	0.0	0.0	0.0	98,625.1

Activity Data Rating: B

Emission Factor Rating: D

Overall Rating: D

Date: April 6, 2005

APPENDIX D
ADDITIONAL MOTOR VEHICLE DATA

Aguascalientes: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	849.5	98.6	2,971.6	24,443.2	56.4	51.4	35.0
Light-Duty Gasoline Truck (LDGT)	556.5	87.1	1,691.1	16,211.2	49.7	45.4	24.2
Heavy-Duty Gasoline Vehicle (HDGV)	112.4	14.5	240.2	2,947.4	2.2	1.9	2.0
Light-Duty Diesel Vehicle (LDDV)	6.5	0.3	8.3	15.3	1.3	1.2	0.3
Light-Duty Diesel Truck (LDDT)	3.2	0.2	4.4	8.6	0.7	0.6	0.1
Heavy-Duty Diesel Vehicle (HDDV)	2,644.2	41.9	411.9	2,473.0	94.7	87.3	10.0
Motorcycle (MC)	9.3	1.2	38.7	309.6	0.1	0.1	1.0
Total	4,181.5	243.9	5,366.2	46,408.2	205.0	187.8	72.7

Baja California: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	2,846.1	303.9	9,435.4	68,790.2	173.9	158.6	117.8
Light-Duty Gasoline Truck (LDGT)	1,831.5	268.6	5,134.8	44,979.7	153.3	140.0	81.4
Heavy-Duty Gasoline Vehicle (HDGV)	447.6	44.6	703.3	5,316.6	6.7	5.7	6.7
Light-Duty Diesel Vehicle (LDDV)	20.0	1.0	16.6	33.2	4.1	3.8	1.0
Light-Duty Diesel Truck (LDDT)	10.5	0.6	9.1	17.5	2.0	1.9	0.4
Heavy-Duty Diesel Vehicle (HDDV)	8,044.4	129.3	653.7	3,308.2	292.0	269.3	33.8
Motorcycle (MC)	38.4	3.7	100.4	610.9	0.4	0.3	3.2
Total	13,238.6	751.8	16,053.3	123,056.3	632.5	579.5	244.3

Baja California Sur: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	276.2	29.8	914.2	6,636.3	17.1	15.6	12.9
Light-Duty Gasoline Truck (LDGT)	177.6	26.3	496.8	4,350.3	15.0	13.7	8.9
Heavy-Duty Gasoline Vehicle (HDGV)	43.7	4.4	67.5	498.7	0.7	0.6	0.7
Light-Duty Diesel Vehicle (LDDV)	1.9	0.1	1.6	3.2	0.4	0.4	0.1
Light-Duty Diesel Truck (LDDT)	1.0	0.1	0.9	1.7	0.2	0.2	0.0
Heavy-Duty Diesel Vehicle (HDDV)	773.1	12.7	63.1	312.8	28.6	26.4	3.7
Motorcycle (MC)	3.8	0.4	9.7	57.9	0.0	0.0	0.4
Total	1,277.2	73.7	1,553.8	11,860.9	62.0	56.8	26.8

Campeche: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	477.3	53.0	1,674.6	11,904.6	30.3	27.7	18.6
Light-Duty Gasoline Truck (LDGT)	305.7	46.8	900.0	7,596.7	26.7	24.4	12.9
Heavy-Duty Gasoline Vehicle (HDGV)	77.1	7.8	124.4	883.2	1.2	1.0	1.1
Light-Duty Diesel Vehicle (LDDV)	3.4	0.2	2.8	5.5	0.7	0.7	0.2
Light-Duty Diesel Truck (LDDT)	1.8	0.1	1.5	2.9	0.4	0.3	0.1
Heavy-Duty Diesel Vehicle (HDDV)	1,354.4	22.5	106.8	518.7	50.9	47.0	5.3
Motorcycle (MC)	6.3	0.7	17.4	106.8	0.1	0.0	0.5
Total	2,225.9	131.1	2,827.5	21,018.5	110.3	101.1	38.6

Coahuila: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	2,192.2	238.5	7,257.2	57,441.3	136.4	124.4	81.7
Light-Duty Gasoline Truck (LDGT)	1,426.1	210.8	4,018.5	37,955.2	120.2	109.8	56.5
Heavy-Duty Gasoline Vehicle (HDGV)	326.2	35.0	547.0	5,213.9	5.3	4.5	4.6
Light-Duty Diesel Vehicle (LDDV)	15.7	0.8	15.5	29.8	3.2	3.0	0.7
Light-Duty Diesel Truck (LDDT)	8.1	0.5	8.3	16.2	1.6	1.5	0.3
Heavy-Duty Diesel Vehicle (HDDV)	6,342.3	101.5	682.4	3,795.6	229.0	211.2	23.4
Motorcycle (MC)	28.1	2.9	82.0	562.6	0.3	0.2	2.2
Total	10,338.6	589.9	12,611.0	105,014.5	496.0	454.5	169.5

Colima: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	339.6	37.0	1,208.5	8,484.6	21.2	19.4	15.3
Light-Duty Gasoline Truck (LDGT)	217.1	32.7	651.6	5,381.6	18.7	17.1	10.6
Heavy-Duty Gasoline Vehicle (HDGV)	53.2	5.4	92.1	680.0	0.8	0.7	0.9
Light-Duty Diesel Vehicle (LDDV)	2.4	0.1	2.0	4.0	0.5	0.5	0.1
Light-Duty Diesel Truck (LDDT)	1.3	0.1	1.1	2.1	0.2	0.2	0.1
Heavy-Duty Diesel Vehicle (HDDV)	966.6	15.8	79.8	398.2	35.6	32.8	4.4
Motorcycle (MC)	4.4	0.5	12.6	81.3	0.0	0.0	0.4
Total	1,584.6	91.6	2,047.7	15,031.8	77.1	70.7	31.8

Chiapas: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	2,166.1	243.6	7,563.1	55,868.2	139.5	127.2	85.1
Light-Duty Gasoline Truck (LDGT)	1,395.7	215.2	4,106.7	35,981.3	123.0	112.3	58.8
Heavy-Duty Gasoline Vehicle (HDGV)	344.9	35.7	564.3	4,524.2	5.4	4.6	4.8
Light-Duty Diesel Vehicle (LDDV)	15.7	0.8	14.1	27.5	3.3	3.0	0.7
Light-Duty Diesel Truck (LDDT)	8.1	0.5	7.7	14.8	1.6	1.5	0.3
Heavy-Duty Diesel Vehicle (HDDV)	6,332.2	103.6	569.6	2,973.9	234.2	216.0	24.4
Motorcycle (MC)	28.4	3.0	81.9	528.3	0.3	0.2	2.3
Total	10,291.1	602.3	12,907.3	99,918.2	507.3	464.8	176.5

Chihuahua: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	3,040.7	328.5	10,132.7	79,781.1	188.0	171.5	119.5
Light-Duty Gasoline Truck (LDGT)	1,976.7	290.3	5,619.9	52,589.2	165.7	151.3	82.6
Heavy-Duty Gasoline Vehicle (HDGV)	444.9	48.2	774.2	7,462.1	7.3	6.2	6.8
Light-Duty Diesel Vehicle (LDDV)	21.7	1.0	21.7	41.8	4.4	4.1	1.0
Light-Duty Diesel Truck (LDDT)	11.2	0.6	11.7	22.6	2.2	2.0	0.4
Heavy-Duty Diesel Vehicle (HDDV)	8,785.6	139.8	967.2	5,412.7	315.7	291.1	34.3
Motorcycle (MC)	38.2	4.0	114.9	804.7	0.4	0.3	3.2
Total	14,319.1	812.6	17,642.2	146,114.3	683.8	626.5	247.8

Distrito Federal: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	12,663.1	1,348.2	47,798.8	375,150.6	771.4	703.8	468.5
Light-Duty Gasoline Truck (LDGT)	8,259.0	1,192.6	27,432.7	240,421.8	680.1	620.9	323.8
Heavy-Duty Gasoline Vehicle (HDGV)	1,412.8	198.1	4,570.1	63,576.4	29.9	25.4	26.6
Light-Duty Diesel Vehicle (LDDV)	97.9	4.3	135.1	254.8	18.2	16.8	3.8
Light-Duty Diesel Truck (LDDT)	48.6	2.7	69.8	140.2	9.0	8.2	1.7
Heavy-Duty Diesel Vehicle (HDDV)	39,673.0	574.1	7,876.0	52,629.2	1,295.6	1,194.6	134.2
Motorcycle (MC)	112.9	16.5	639.1	5,573.8	1.6	1.2	12.7
Total	62,267.5	3,336.6	88,521.6	737,746.9	2,805.8	2,570.8	971.3

Durango: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,168.1	129.5	3,848.1	32,543.3	74.1	67.6	47.3
Light-Duty Gasoline Truck (LDGT)	766.4	114.4	2,160.6	21,692.2	65.3	59.6	32.7
Heavy-Duty Gasoline Vehicle (HDGV)	166.7	19.0	288.8	3,170.6	2.9	2.4	2.7
Light-Duty Diesel Vehicle (LDDV)	8.4	0.4	9.4	17.7	1.8	1.6	0.4
Light-Duty Diesel Truck (LDDT)	4.3	0.3	5.0	9.7	0.9	0.8	0.2
Heavy-Duty Diesel Vehicle (HDDV)	3,436.3	55.1	431.7	2,481.7	124.4	114.7	13.6
Motorcycle (MC)	14.4	1.6	45.6	337.5	0.2	0.1	1.3
Total	5,564.7	320.3	6,789.2	60,252.7	269.4	246.8	98.1

Guanajuato: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	3,438.2	400.9	12,175.5	98,253.6	227.7	207.8	166.1
Light-Duty Gasoline Truck (LDGT)	2,247.3	354.4	6,920.7	64,867.7	200.8	183.3	114.8
Heavy-Duty Gasoline Vehicle (HDGV)	451.6	58.9	1,002.9	12,256.6	8.8	7.5	9.4
Light-Duty Diesel Vehicle (LDDV)	26.1	1.3	33.8	62.4	5.4	5.0	1.3
Light-Duty Diesel Truck (LDDT)	13.0	0.8	17.9	34.8	2.6	2.4	0.6
Heavy-Duty Diesel Vehicle (HDDV)	10,677.7	170.6	1,700.4	10,263.2	382.5	352.7	47.6
Motorcycle (MC)	37.1	4.9	158.3	1,267.2	0.5	0.3	4.5
Total	16,891.1	991.7	22,009.4	187,005.5	828.4	759.0	344.3

Guerrero: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,946.8	217.2	6,806.6	49,664.6	124.3	113.4	77.2
Light-Duty Gasoline Truck (LDGT)	1,252.0	191.9	3,680.4	31,844.0	109.6	100.0	53.3
Heavy-Duty Gasoline Vehicle (HDGV)	312.9	31.9	506.7	3,876.1	4.8	4.1	4.4
Light-Duty Diesel Vehicle (LDDV)	14.0	0.7	12.1	23.8	2.9	2.7	0.6
Light-Duty Diesel Truck (LDDT)	7.3	0.4	6.6	12.7	1.4	1.3	0.3
Heavy-Duty Diesel Vehicle (HDDV)	5,656.6	92.4	474.0	2,423.0	208.8	192.5	22.1
Motorcycle (MC)	25.8	2.7	72.2	456.9	0.3	0.2	2.1
Total	9,215.5	537.1	11,558.6	88,301.0	452.1	414.2	160.0

Hidalgo: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,108.0	129.0	3,875.7	31,104.1	73.9	67.4	45.2
Light-Duty Gasoline Truck (LDGT)	723.1	114.0	2,183.5	20,545.1	65.1	59.5	31.3
Heavy-Duty Gasoline Vehicle (HDGV)	154.8	18.9	305.5	3,448.2	2.9	2.4	2.6
Light-Duty Diesel Vehicle (LDDV)	8.4	0.4	10.1	18.7	1.7	1.6	0.4
Light-Duty Diesel Truck (LDDT)	4.2	0.3	5.4	10.4	0.9	0.8	0.2
Heavy-Duty Diesel Vehicle (HDDV)	3,416.2	54.9	479.5	2,814.6	124.1	114.4	13.0
Motorcycle (MC)	12.8	1.6	48.8	372.4	0.2	0.1	1.2
Total	5,427.6	319.0	6,908.5	58,313.6	268.7	246.2	93.8

Jalisco: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	8,745.4	951.1	32,504.5	255,753.8	544.4	496.6	344.6
Light-Duty Gasoline Truck (LDGT)	5,700.4	841.1	18,540.9	164,808.8	479.9	438.1	238.1
Heavy-Duty Gasoline Vehicle (HDGV)	1,040.4	139.7	2,973.6	39,502.4	21.1	17.9	19.6
Light-Duty Diesel Vehicle (LDDV)	67.1	3.0	89.2	167.7	12.9	11.9	2.8
Light-Duty Diesel Truck (LDDT)	33.4	1.9	46.4	92.4	6.3	5.8	1.3
Heavy-Duty Diesel Vehicle (HDDV)	27,220.4	404.9	4,985.9	32,506.3	914.2	843.0	98.7
Motorcycle (MC)	83.9	11.7	426.8	3,619.9	1.1	0.8	9.4
Total	42,891.1	2,353.2	59,567.3	496,451.4	1,979.9	1,814.1	714.4

State of México: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	14,215.3	1,555.3	52,608.6	416,944.7	889.9	811.9	609.7
Light-Duty Gasoline Truck (LDGT)	9,278.6	1,375.3	30,111.9	269,712.0	784.6	716.2	421.4
Heavy-Duty Gasoline Vehicle (HDGV)	1,673.8	228.4	4,817.9	64,902.5	34.5	29.3	34.6
Light-Duty Diesel Vehicle (LDDV)	109.4	4.9	148.1	277.5	21.0	19.4	4.9
Light-Duty Diesel Truck (LDDT)	54.4	3.1	77.0	153.3	10.3	9.5	2.3
Heavy-Duty Diesel Vehicle (HDDV)	44,430.0	662.0	8,273.4	53,882.8	1,494.5	1,378.0	174.7
Motorcycle (MC)	135.3	19.1	698.5	5,947.9	1.8	1.3	16.6
Total	69,896.7	3,848.1	96,735.4	811,820.6	3,236.7	2,965.6	1,264.2

Michoacán: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	2,215.8	256.2	7,806.6	62,101.7	146.7	133.8	98.9
Light-Duty Gasoline Truck (LDGT)	1,444.5	226.4	4,399.4	40,898.2	129.3	118.1	68.3
Heavy-Duty Gasoline Vehicle (HDGV)	304.4	37.6	624.4	7,083.3	5.7	4.8	5.6
Light-Duty Diesel Vehicle (LDDV)	16.7	0.8	20.3	37.7	3.5	3.2	0.8
Light-Duty Diesel Truck (LDDT)	8.4	0.5	10.8	21.0	1.7	1.6	0.4
Heavy-Duty Diesel Vehicle (HDDV)	6,804.6	109.0	981.2	5,771.2	246.3	227.1	28.3
Motorcycle (MC)	25.1	3.1	98.2	760.5	0.3	0.2	2.7
Total	10,819.5	633.6	13,941.0	116,673.6	533.5	488.8	205.1

Morelos: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,175.5	134.9	4,122.9	32,282.6	77.2	70.4	47.0
Light-Duty Gasoline Truck (LDGT)	764.3	119.2	2,301.6	21,156.3	68.0	62.1	32.5
Heavy-Duty Gasoline Vehicle (HDGV)	168.3	19.8	324.5	3,444.6	3.0	2.5	2.7
Light-Duty Diesel Vehicle (LDDV)	8.8	0.4	10.0	18.7	1.8	1.7	0.4
Light-Duty Diesel Truck (LDDT)	4.4	0.3	5.3	10.3	0.9	0.8	0.2
Heavy-Duty Diesel Vehicle (HDDV)	3,570.1	57.4	467.4	2,712.7	129.6	119.5	13.5
Motorcycle (MC)	13.9	1.7	50.1	372.1	0.2	0.1	1.3
Total	5,705.1	333.7	7,281.7	59,997.4	280.7	257.2	97.5

Nayarit: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	609.3	67.5	2,110.4	15,309.9	38.6	35.2	22.2
Light-Duty Gasoline Truck (LDGT)	391.6	59.6	1,135.5	9,807.9	34.1	31.1	15.4
Heavy-Duty Gasoline Vehicle (HDGV)	100.3	9.9	155.1	1,112.6	1.5	1.3	1.3
Light-Duty Diesel Vehicle (LDDV)	4.4	0.2	3.5	7.0	0.9	0.8	0.2
Light-Duty Diesel Truck (LDDT)	2.3	0.1	1.9	3.7	0.4	0.4	0.1
Heavy-Duty Diesel Vehicle (HDDV)	1,760.2	28.7	132.2	654.4	64.9	59.8	6.4
Motorcycle (MC)	8.3	0.8	21.9	131.9	0.1	0.1	0.6
Total	2,876.4	167.0	3,560.6	27,027.5	140.5	128.7	46.1

Nuevo León: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	7,881.2	786.3	27,605.8	196,434.0	450.0	410.5	271.6
Light-Duty Gasoline Truck (LDGT)	5,047.1	695.4	15,211.5	125,197.3	396.7	362.2	187.7
Heavy-Duty Gasoline Vehicle (HDGV)	1,097.4	115.5	2,255.3	19,240.6	17.5	14.8	15.4
Light-Duty Diesel Vehicle (LDDV)	56.1	2.5	48.5	98.8	10.6	9.8	2.2
Light-Duty Diesel Truck (LDDT)	29.4	1.6	26.2	51.5	5.2	4.8	1.0
Heavy-Duty Diesel Vehicle (HDDV)	22,399.4	334.8	2,139.1	11,772.3	755.7	696.8	77.8
Motorcycle (MC)	94.4	9.6	303.1	2,275.7	0.9	0.7	7.4
Total	36,605.1	1,945.6	47,589.3	355,070.0	1,636.6	1,499.5	563.2

Oaxaca: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,754.5	201.7	6,123.3	47,667.5	115.5	105.4	65.3
Light-Duty Gasoline Truck (LDGT)	1,139.4	178.2	3,399.2	31,205.0	101.9	93.0	45.1
Heavy-Duty Gasoline Vehicle (HDGV)	259.8	29.6	470.2	4,689.5	4.5	3.8	3.7
Light-Duty Diesel Vehicle (LDDV)	13.0	0.6	14.1	26.6	2.7	2.5	0.5
Light-Duty Diesel Truck (LDDT)	6.6	0.4	7.6	14.7	1.3	1.2	0.2
Heavy-Duty Diesel Vehicle (HDDV)	5,303.3	85.8	633.6	3,590.1	194.0	178.9	18.7
Motorcycle (MC)	21.5	2.5	72.7	522.7	0.2	0.2	1.8
Total	8,498.2	498.8	10,720.8	87,716.1	420.2	385.0	135.4

Puebla: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	3,532.4	408.3	12,479.1	99,811.8	233.8	213.3	148.7
Light-Duty Gasoline Truck (LDGT)	2,305.2	360.8	7,056.9	65,757.8	206.1	188.2	102.7
Heavy-Duty Gasoline Vehicle (HDGV)	476.2	59.9	1,014.6	11,937.7	9.1	7.7	8.4
Light-Duty Diesel Vehicle (LDDV)	26.6	1.3	33.4	61.9	5.5	5.1	1.2
Light-Duty Diesel Truck (LDDT)	13.3	0.8	17.7	34.4	2.7	2.5	0.6
Heavy-Duty Diesel Vehicle (HDDV)	10,878.7	173.7	1,652.2	9,860.6	392.7	362.0	42.6
Motorcycle (MC)	39.2	5.0	159.3	1,249.4	0.5	0.4	4.0
Total	17,271.6	1,009.8	22,413.2	188,713.6	850.4	779.2	308.2

Querétaro: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	967.6	112.4	3,402.8	27,558.5	64.3	58.7	48.1
Light-Duty Gasoline Truck (LDGT)	632.6	99.3	1,930.0	18,225.9	56.7	51.8	33.2
Heavy-Duty Gasoline Vehicle (HDGV)	130.0	16.5	275.1	3,294.2	2.5	2.1	2.7
Light-Duty Diesel Vehicle (LDDV)	7.4	0.4	9.3	17.2	1.5	1.4	0.4
Light-Duty Diesel Truck (LDDT)	3.7	0.2	4.9	9.6	0.7	0.7	0.2
Heavy-Duty Diesel Vehicle (HDDV)	3,010.9	47.8	458.1	2,743.1	108.0	99.6	13.8
Motorcycle (MC)	10.7	1.4	43.9	346.5	0.1	0.1	1.3
Total	4,762.9	278.1	6,124.1	52,195.1	233.9	214.4	99.7

Quintana Roo: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	756.1	82.7	2,669.1	19,015.2	47.3	43.1	30.0
Light-Duty Gasoline Truck (LDGT)	484.5	73.1	1,437.7	12,078.4	41.7	38.1	20.7
Heavy-Duty Gasoline Vehicle (HDGV)	120.8	12.1	201.3	1,478.9	1.8	1.6	1.7
Light-Duty Diesel Vehicle (LDDV)	5.4	0.3	4.4	8.9	1.1	1.0	0.2
Light-Duty Diesel Truck (LDDT)	2.8	0.2	2.4	4.7	0.5	0.5	0.1
Heavy-Duty Diesel Vehicle (HDDV)	2,177.9	35.2	171.7	860.6	79.4	73.2	8.6
Motorcycle (MC)	9.9	1.0	27.6	175.5	0.1	0.1	0.8
Total	3,557.4	204.5	4,514.4	33,622.1	172.0	157.6	62.2

San Luis Potosí: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,654.1	185.1	5,560.1	47,296.0	105.9	96.6	61.7
Light-Duty Gasoline Truck (LDGT)	1,086.7	163.5	3,127.9	31,363.9	93.4	85.2	42.6
Heavy-Duty Gasoline Vehicle (HDGV)	231.4	27.2	424.6	4,849.9	4.1	3.5	3.5
Light-Duty Diesel Vehicle (LDDV)	12.0	0.6	14.0	26.1	2.5	2.3	0.5
Light-Duty Diesel Truck (LDDT)	6.1	0.4	7.4	14.4	1.2	1.1	0.2
Heavy-Duty Diesel Vehicle (HDDV)	4,909.0	78.7	658.2	3,843.1	177.8	164.0	17.7
Motorcycle (MC)	19.7	2.3	66.6	510.0	0.2	0.2	1.7
Total	7,919.0	457.7	9,858.8	87,903.4	385.1	352.9	127.9

Sinaloa: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,919.2	207.8	6,318.6	46,506.1	118.9	108.5	93.3
Light-Duty Gasoline Truck (LDGT)	1,236.6	183.6	3,428.0	30,491.3	104.8	95.7	64.5
Heavy-Duty Gasoline Vehicle (HDGV)	310.6	30.5	460.4	3,376.7	4.6	3.9	5.3
Light-Duty Diesel Vehicle (LDDV)	13.5	0.7	11.0	22.0	2.8	2.6	0.8
Light-Duty Diesel Truck (LDDT)	7.1	0.4	6.0	11.6	1.4	1.3	0.3
Heavy-Duty Diesel Vehicle (HDDV)	5,449.0	88.4	420.4	2,094.1	199.7	184.1	26.7
Motorcycle (MC)	26.6	2.6	66.8	389.3	0.2	0.2	2.5
Total	8,962.6	514.0	10,711.2	82,891.0	432.4	396.2	193.5

Sonora: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,700.0	182.8	5,621.2	41,113.4	104.6	95.4	74.1
Light-Duty Gasoline Truck (LDGT)	1,094.7	161.6	3,057.2	26,943.2	92.2	84.2	51.2
Heavy-Duty Gasoline Vehicle (HDGV)	269.3	26.8	415.5	3,123.2	4.1	3.4	4.2
Light-Duty Diesel Vehicle (LDDV)	11.9	0.6	9.9	19.8	2.5	2.3	0.6
Light-Duty Diesel Truck (LDDT)	6.3	0.4	5.4	10.5	1.2	1.1	0.3
Heavy-Duty Diesel Vehicle (HDDV)	4,800.2	77.8	390.2	1,964.3	175.7	162.0	21.2
Motorcycle (MC)	23.1	2.2	59.8	358.4	0.2	0.2	2.0
Total	7,905.5	452.2	9,559.4	73,532.7	380.5	348.6	153.7

Tabasco: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,081.8	119.9	3,782.3	27,271.1	68.6	62.6	63.0
Light-Duty Gasoline Truck (LDGT)	694.7	105.9	2,033.1	17,397.6	60.5	55.2	43.5
Heavy-Duty Gasoline Vehicle (HDGV)	177.8	17.6	279.5	1,996.8	2.7	2.3	3.6
Light-Duty Diesel Vehicle (LDDV)	7.8	0.4	6.2	12.5	1.6	1.5	0.5
Light-Duty Diesel Truck (LDDT)	4.1	0.2	3.4	6.6	0.8	0.7	0.2
Heavy-Duty Diesel Vehicle (HDDV)	3,129.6	51.0	234.3	1,159.8	115.2	106.3	18.1
Motorcycle (MC)	14.6	1.5	39.0	237.4	0.1	0.1	1.7
Total	5,110.3	296.4	6,377.8	48,081.8	249.6	228.7	130.6

Tamaulipas: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	2,629.0	282.4	8,663.4	63,617.7	161.5	147.3	105.9
Light-Duty Gasoline Truck (LDGT)	1,693.8	249.6	4,708.7	41,700.3	142.4	130.0	73.2
Heavy-Duty Gasoline Vehicle (HDGV)	419.9	41.4	637.7	4,759.5	6.3	5.3	6.0
Light-Duty Diesel Vehicle (LDDV)	18.6	0.9	15.2	30.4	3.8	3.5	0.9
Light-Duty Diesel Truck (LDDT)	9.7	0.6	8.3	16.1	1.9	1.7	0.4
Heavy-Duty Diesel Vehicle (HDDV)	7,464.6	120.1	589.0	2,963.8	271.2	250.0	30.3
Motorcycle (MC)	36.1	3.5	91.9	545.8	0.3	0.2	2.9
Total	12,271.6	698.5	14,714.2	113,633.7	587.3	538.1	219.6

Tlaxcala: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	713.3	83.0	2,512.2	20,446.5	47.4	43.3	33.3
Light-Duty Gasoline Truck (LDGT)	466.7	73.3	1,429.2	13,539.0	41.8	38.2	23.0
Heavy-Duty Gasoline Vehicle (HDGV)	94.2	12.2	204.7	2,503.9	1.8	1.6	1.9
Light-Duty Diesel Vehicle (LDDV)	5.5	0.3	7.0	13.0	1.1	1.0	0.3
Light-Duty Diesel Truck (LDDT)	2.7	0.2	3.7	7.2	0.6	0.5	0.1
Heavy-Duty Diesel Vehicle (HDDV)	2,228.5	35.3	349.1	2,101.8	79.7	73.5	9.6
Motorcycle (MC)	7.8	1.0	32.8	262.0	0.1	0.1	0.9
Total	3,518.7	205.2	4,538.7	38,873.4	172.6	158.1	69.1

Veracruz: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	4,379.1	487.7	15,333.5	112,505.8	279.1	254.7	184.5
Light-Duty Gasoline Truck (LDGT)	2,819.0	430.9	8,321.7	72,242.2	246.1	224.7	127.5
Heavy-Duty Gasoline Vehicle (HDGV)	693.6	71.6	1,153.5	9,238.5	10.8	9.2	10.5
Light-Duty Diesel Vehicle (LDDV)	31.7	1.5	28.1	55.1	6.6	6.1	1.5
Light-Duty Diesel Truck (LDDT)	16.5	1.0	15.3	29.6	3.2	3.0	0.7
Heavy-Duty Diesel Vehicle (HDDV)	12,795.7	207.4	1,137.6	5,970.4	468.8	432.2	52.9
Motorcycle (MC)	57.1	6.0	164.9	1,070.1	0.6	0.4	5.0
Total	20,792.6	1,206.1	26,154.6	201,111.6	1,015.2	930.2	382.5

Yucatán: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	1,321.3	145.1	4,644.0	33,314.8	83.0	75.7	49.1
Light-Duty Gasoline Truck (LDGT)	847.7	128.2	2,499.6	21,192.7	73.2	66.8	33.9
Heavy-Duty Gasoline Vehicle (HDGV)	213.8	21.3	347.5	2,531.7	3.2	2.7	2.8
Light-Duty Diesel Vehicle (LDDV)	9.5	0.5	7.7	15.4	2.0	1.8	0.4
Light-Duty Diesel Truck (LDDT)	5.0	0.3	4.2	8.1	1.0	0.9	0.2
Heavy-Duty Diesel Vehicle (HDDV)	3,823.4	61.7	293.7	1,469.8	139.4	128.5	14.1
Motorcycle (MC)	17.5	1.8	48.0	299.9	0.2	0.1	1.3
Total	6,238.3	358.9	7,844.7	58,832.5	301.9	276.6	101.9

Zacatecas: 1999 Motor Vehicle Emissions Inventory (Final)
Mg/year, by Vehicle Classification

Vehicle Classification	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Light-Duty Gasoline Vehicle (LDGV)	675.4	76.8	2,245.6	20,050.9	44.0	40.1	28.4
Light-Duty Gasoline Truck (LDGT)	446.6	67.8	1,281.3	13,445.1	38.8	35.4	19.6
Heavy-Duty Gasoline Vehicle (HDGV)	90.0	11.3	170.1	2,132.7	1.7	1.4	1.6
Light-Duty Diesel Vehicle (LDDV)	4.9	0.2	6.3	11.5	1.0	1.0	0.2
Light-Duty Diesel Truck (LDDT)	2.4	0.2	3.3	6.5	0.5	0.5	0.1
Heavy-Duty Diesel Vehicle (HDDV)	2,012.1	32.7	303.9	1,777.7	73.9	68.1	8.1
Motorcycle (MC)	7.8	0.9	28.2	227.4	0.1	0.1	0.8
Total	3,239.1	189.9	4,038.8	37,651.9	160.0	146.6	58.9

APPENDIX E

ADDITIONAL NONROAD MOBILE SOURCE DATA

Aguascalientes: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,321.1	17.7	135.4	660.0	148.8	144.3
Agricultural Equipment	1,121.9	14.8	185.7	747.3	190.3	184.6
Total	2,443.0	32.5	321.0	1,407.3	339.1	328.9

Baja California: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	8,172.9	109.6	844.5	4,092.3	919.9	892.3
Agricultural Equipment	1,391.7	17.5	235.1	943.3	235.1	228.0
Total	9,564.6	127.1	1,079.6	5,035.6	1,154.9	1,120.3

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Baja California Sur: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,326.2	17.8	137.3	664.8	149.3	144.8
Agricultural Equipment	514.9	6.6	86.7	346.4	87.2	84.6
Total	1,841.2	24.4	224.0	1,011.2	236.5	229.4

Campeche: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,212.6	16.2	118.5	594.4	136.5	132.4
Agricultural Equipment	1,562.5	19.9	261.5	1,047.7	264.6	256.7
Total	2,775.1	36.1	380.0	1,642.0	401.2	389.1

Coahuila: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	7,322.9	98.2	756.9	3,660.9	823.5	798.8
Agricultural Equipment	1,414.8	18.5	235.7	946.5	239.8	232.6
Total	8,737.6	116.7	992.6	4,607.3	1,063.3	1,031.4

Colima: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	969.4	13.0	99.7	482.5	108.9	105.6
Agricultural Equipment	547.7	7.2	91.8	368.7	92.9	90.1
Total	1,517.1	20.2	191.5	851.2	201.8	195.7

Chiapas: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,240.9	16.6	125.8	617.1	139.7	135.5
Agricultural Equipment	984.3	13.0	163.9	658.5	167.0	162.0
Total	2,225.2	29.6	289.7	1,275.6	306.7	297.5

Chihuahua: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	8,947.9	120.0	925.0	4,478.4	1,006.8	976.6
Agricultural Equipment	8,974.1	115.4	1,503.9	6,068.5	1,517.9	1,472.4
Total	17,921.9	235.4	2,428.9	10,546.9	2,524.8	2,449.0

Distrito Federal: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	17,294.2	231.7	1,769.1	8,640.4	1,948.1	1,889.7
Agricultural Equipment	289.7	3.8	47.9	193.3	49.1	47.6
Total	17,583.9	235.5	1,817.0	8,833.7	1,997.2	1,937.3

Durango: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,792.4	24.0	184.8	897.2	201.8	195.7
Agricultural Equipment	4,594.4	60.5	765.2	3,086.8	779.2	755.8
Total	6,386.8	84.5	950.0	3,983.9	980.9	951.5

Guanajuato: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,962.2	26.3	202.5	979.9	220.6	214.0
Agricultural Equipment	5,796.1	85.8	1,108.9	4,528.2	1,042.5	1,011.2
Total	7,758.3	112.1	1,311.4	5,508.0	1,263.1	1,225.2

Guerrero: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,327.9	17.8	135.9	661.4	149.4	144.9
Agricultural Equipment	504.1	7.6	98.8	401.6	90.4	87.7
Total	1,832.0	25.4	234.8	1,063.1	239.8	232.6

Hidalgo: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	8,256.1	110.7	851.3	4,132.2	929.4	901.5
Agricultural Equipment	8,137.3	106.4	1,346.9	5,438.7	1,471.4	1,427.3
Total	16,393.3	217.1	2,198.2	9,570.9	2,400.8	2,328.8

Jalisco: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	11,389.6	152.8	1,180.5	5,711.5	1,282.1	1,243.6
Agricultural Equipment	12,946.7	166.6	2,147.3	8,673.0	2,338.9	2,268.8
Total	24,336.3	319.5	3,327.9	14,384.6	3,621.0	3,512.3

State of México: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	5,015.4	67.3	517.4	2,509.3	564.5	547.5
Agricultural Equipment	5,192.7	68.0	856.9	3,458.6	939.2	911.0
Total	10,208.1	135.2	1,374.3	5,968.0	1,503.6	1,458.5

Michoacán: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	2,191.8	29.4	224.9	1,095.3	246.8	239.4
Agricultural Equipment	6,972.8	90.3	1,155.0	4,665.9	1,260.4	1,222.6
Total	9,164.6	119.6	1,380.0	5,761.2	1,507.2	1,462.0

Morelos: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,597.2	21.4	165.5	800.8	179.8	174.4
Agricultural Equipment	1,749.5	23.2	289.5	1,166.7	316.6	307.1
Total	3,346.7	44.6	454.9	1,967.4	496.4	481.5

Nayarit: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	942.4	12.6	94.7	468.4	106.3	103.1
Agricultural Equipment	3,572.2	45.8	612.3	2,391.0	649.3	629.8
Total	4,514.5	58.4	706.9	2,859.4	755.5	732.9

Nuevo León: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	11,833.7	158.7	1,219.8	5,921.3	1,332.1	1,292.1
Agricultural Equipment	1,126.5	14.4	187.2	757.9	190.3	184.6
Total	12,960.2	173.0	1,407.0	6,679.2	1,522.3	1,476.7

Oaxaca: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	1,100.3	14.7	112.1	544.1	123.4	119.7
Agricultural Equipment	4,707.1	61.6	776.0	3,130.9	797.9	774.0
Total	5,807.4	76.3	888.1	3,675.0	921.4	893.7

Puebla: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	4,607.4	61.2	471.2	2,145.6	527.9	512.1
Agricultural Equipment	2,618.6	34.2	432.3	1,745.6	473.5	459.3
Total	7,226.0	95.4	903.5	3,891.2	1,001.4	971.4

Querétaro: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	2,559.2	34.3	264.3	1,281.6	288.1	279.4
Agricultural Equipment	1,141.6	15.0	188.0	758.6	193.6	187.8
Total	3,700.8	49.3	452.3	2,040.2	481.7	467.2

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Quintana Roo: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	2,333.8	31.3	241.2	1,167.8	262.6	254.7
Agricultural Equipment	256.4	3.3	42.5	172.0	43.3	42.0
Total	2,590.1	34.6	283.6	1,339.8	305.9	296.7

San Luis Potosí: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	2,725.3	36.5	281.4	1,363.7	306.7	297.5
Agricultural Equipment	5,592.3	72.8	937.7	3,761.9	948.4	920.0
Total	8,317.6	109.3	1,219.0	5,125.7	1,255.1	1,217.4

Sinaloa: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	6,052.4	81.2	627.6	3,035.6	681.3	660.8
Agricultural Equipment	6,771.7	84.9	1,129.9	4,578.4	1,141.6	1,107.4
Total	12,824.2	166.1	1,757.6	7,614.0	1,822.9	1,768.2

Sonora: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	6,535.4	87.7	675.7	3,273.8	735.6	713.5
Agricultural Equipment	3,718.5	47.0	622.3	2,509.8	627.7	608.9
Total	10,253.9	134.7	1,298.0	5,783.6	1,363.3	1,322.4

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Tabasco: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	2,560.5	34.2	256.6	1,268.6	288.4	279.8
Agricultural Equipment	1,556.7	19.8	258.4	1,045.5	263.1	255.2
Total	4,117.3	54.0	515.0	2,314.1	551.5	535.0

Tamaulipas: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	7,488.6	100.4	772.5	3,744.2	842.5	817.2
Agricultural Equipment	10,898.4	135.3	1,825.8	7,397.3	1,835.9	1,780.9
Total	18,387.0	235.7	2,598.3	11,141.4	2,678.4	2,598.1

Tlaxcala: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	395.6	5.3	40.7	197.5	44.5	43.2
Agricultural Equipment	3,167.9	41.0	524.5	2,121.1	536.1	520.0
Total	3,563.6	46.3	565.2	2,318.7	580.6	563.2

Veracruz: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	5,931.2	79.5	612.5	2,970.7	667.7	647.7
Agricultural Equipment	6,844.0	88.9	1,143.1	4,597.5	1,159.8	1,125.1
Total	12,775.2	168.4	1,755.7	7,568.2	1,827.6	1,772.8

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Yucatán: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	3,154.0	42.3	324.3	1,573.8	354.8	344.1
Agricultural Equipment	254.1	3.2	42.3	170.9	42.9	41.6
Total	3,408.2	45.5	366.6	1,744.7	397.7	385.7

Zacatecas: 1999 Nonroad Mobile Source Emissions Inventory (Final)
Mg/year, by Equipment Type

Equipment Types	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}
Construction Equipment	695.2	9.3	70.7	346.1	78.3	75.9
Agricultural Equipment	8,591.0	114.0	1,425.6	5,744.2	1,458.1	1,414.4
Total	9,286.2	123.3	1,496.3	6,090.3	1,536.4	1,490.3

APPENDIX F

ADDITIONAL NATURAL SOURCE DATA

Table F-1. SMN Meteorological Stations that Provided Temperature (Temp) and Cloud Cover (CC) Data

Type (Meteorological, Cloud Cover)	ID #	State	Municipality	Latitude	Longitude
Temp	762430			28.7	-100.51
Temp+CC	765710	Aguascalientes	Aguascalientes	21.88	-102.3
CC	76040	Baja California	Ejido Nuevo León		
CC	76401	Baja California	Puerto Cortéz	26	-111.36
Temp	760053	Baja California		32.63	-117
Temp+CC	762530	Baja California Sur	Santa Rosalía	27.31	-112.3
Temp+CC	763050	Baja California Sur	Loreto	26.01	-111.35
Temp+CC	764020	Baja California Sur	Cd. Constitución	25	-111.66
Temp	764050	Baja California Sur		24.16	-110.41
Temp	764055	Baja California Sur		24.06	-110.36
CC	76405	Baja California Sur	La Paz	23.15	-109.71
Temp	766950	Campeche	Campeche	19.85	-90.55
CC	76695	Campeche	Campeche	19.85	-90.53
Temp+CC	768400	Chiapas	Arriaga	16.23	-93.9
Temp	768430	Chiapas	Tuxtla Gutierrez	16.75	-93.11
Temp+CC	768450	Chiapas	Las Casas	16.73	-92.63
Temp+CC	768480	Chiapas	Comitán	16.25	-92.13
Temp+CC	769030	Chiapas	Tapachula	14.91	-92.26
Temp	769043	Chiapas		14.78	-92.38
CC	76843	Chiapas	Tuxtla Gutierrez	16.75	-93.13
CC	76243	Coahuila	Piedras Negras	28.7	-100.51
Temp	766534	Colima		19.15	-104.56
Temp+CC	766540	Colima	Manzanillo	19.05	-104.33
Temp	766580	Colima	Colima	19.26	-103.58
CC	76658	Colima	Colima	19.26	-103.6
CC	76723	Colima	Isla Socorro	18.71	-110.95
Temp	766790	Distrito Federal		19.43	-99.08
Temp	766793	Distrito Federal		19.43	-99.1
Temp+CC	766800	Distrito Federal	Tacubaya	19.4	-99.2
Temp+CC	763730	Durango	Tepehuanes	25.35	-105.78
Temp+CC	764230	Durango	Durango	24.03	-104.66
Temp	764235	Durango		24.13	-104.53
Temp	764580	Durango		23.2	-106.41
Temp	767230	Fed Land		18.71	-110.95
Temp+CC	765770	Guanajuato	Guanajuato	21.01	-101.25
Temp	765773	Guanajuato		21	-101.48
Temp	767584	Guerrero		17.6	-101.46
Temp+CC	767620	Guerrero	Chilpancingo	17.55	-99.5
Temp	768050	Guerrero		16.83	-99.93
Temp	768056	Guerrero		16.76	-99.75
CC	76805	Guerrero	Acapulco	16.35	-98.06
Temp+CC	766320	Hidálgoo	Pachuca	20.13	-98.73
Temp+CC	766340	Hidálgoo	Tulancingo	20.08	-98.36

Table F-1. Cont.

Type (Meteorological, Cloud Cover)	ID #	State	Municipality	Latitude	Longitude
Temp+CC	765190	Jalisco	Colotlán	22.11	-103.26
Temp	766013	Jalisco		20.68	-105.25
Temp	766120	Jalisco		20.66	-103.38
Temp+CC	766133	Jalisco	Guadalajara	20.51	-103.31
Temp+CC	766560	Jalisco	Cd. Guzmán	19.7	-103.46
Temp	766750	México		19.3	-99.66
Temp+CC	766753	México	Toluca	19.35	-99.56
Temp	766546	Michoacán		19.4	-102.03
Temp+CC	766620	Michoacán	Zamora	19.98	-102.31
Temp	766650	Michoacán		19.7	-101.18
Temp+CC	766655	Michoacán	Morelia	19.85	-101.03
Temp+CC	767260	Morelos	Cuernavaca	18.91	-99.25
Temp+CC	765560	Nayarit	Tepic	21.51	-104.9
Temp+CC	767730	Oaxaca	Huajuapan de León	17.8	-97.68
Temp+CC	767750	Oaxaca	Oaxaca	17.06	-96.71
Temp	767755	Oaxaca		16.96	-96.73
Temp	768485	Oaxaca		15.78	-96.26
Temp+CC	768550	Oaxaca	Puerto Angel	15.65	-96.5
Temp	768556	Oaxaca		15.86	-97.08
Temp+CC	766850	Puebla	Puebla	19.03	-98.2
Temp+CC	766250	Queretaro		20.6	-100.38
Temp	765906	Quintana Roo		21.03	-86.86
Temp	765950	Quintana Roo		21.03	-86.88
Temp	766493	Quintana Roo		20.53	-86.93
Temp+CC	766980	Quintana Roo	Felipe Carrillo Puerto	19.58	-88.03
Temp+CC	767500	Quintana Roo	Othón P. Blanco	18.5	-88.3
Temp+CC	765390	San Luis Potosí	San Luis Potosí	22.15	-100.98
Temp+CC	765810	San Luis Potosí	Río Verde	21.85	-100
Temp+CC	765850	San Luis Potosí	Matlapa	21.33	-98.66
Temp	763615	Sinaloa		25.68	-109.08
Temp+CC	764120	Sinaloa	Culiacán	24.81	-107.43
Temp	764593	Sinaloa		23.16	-106.26
Temp+CC	767430	Tabasco	Villa Hermosa	17.98	-92.91
Temp	767433	Tabasco		18	-92.81
Temp+CC	766830	Tlaxcala	Tlaxcala	19.31	-98.23
Temp+CC	76640	Veracruz	Tuxpan	20.95	-97.4
CC	76687	Veracruz	Jalapa	19.46	-96.75
			Veracruz (Hda. Ylang Ylang)		
Temp+CC	76692	Veracruz		19.15	-96.11
CC	76737	Veracruz	Orizaba	18.5	-97.41
Temp+CC	76741	Veracruz	Coatzacoalcos	18.15	-94.41
Temp	766127	Veracruz		20.5	-97.46
Temp	766870	Veracruz		19.53	-96.91
Temp	766913	Veracruz		19.15	-96.18

Table F-1. Cont.

Type (Meteorological, Cloud Cover)	ID #	State	Municipality	Latitude	Longitude
Temp	767370	Veracruz		18.85	-97.1
Temp	767383	Veracruz		18.1	-94.58
Temp+CC	765930	Yucatán	Progreso	21.3	-89.81
Temp	766440	Yucatán		20.98	-89.65
Temp+CC	766470	Yucatán	Valladolid	20.7	-88.21
CC	76644	Yucatán	Mérida Aeropuerto International	20.93	-89.66
Temp+CC	764710	Zacatecas	Sombrerete	23.63	-103.63
Temp	765250	Zacatecas		22.78	-102.56
Temp	765255	Zacatecas		22.9	-102.68
CC	76525	Zacatecas	Zacatecas	22.9	-102.71

APPENDIX G

STATE LEVEL EMISSIONS INVENTORY SUMMARIES

Figure G-1. 1999 Emissions Inventory for Aguascalientes (Final)

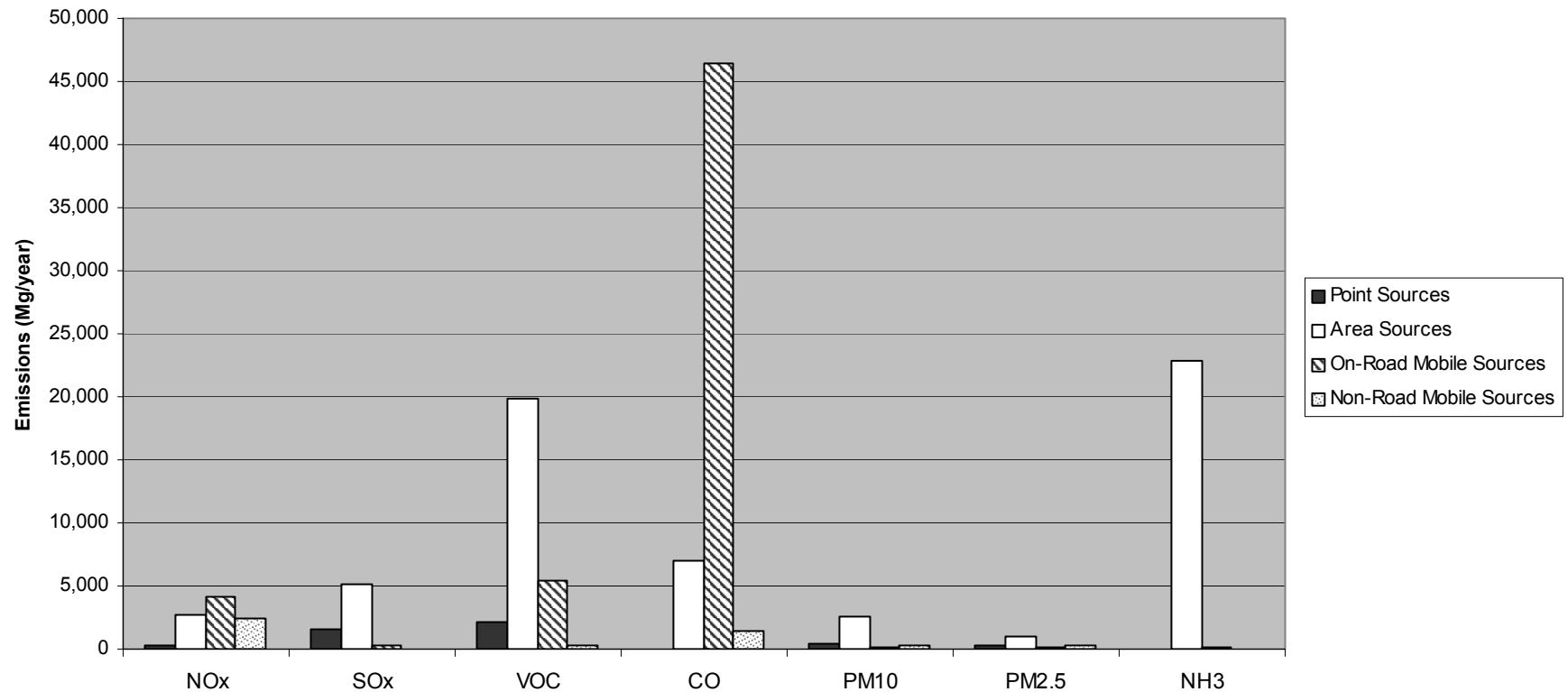


Figure G-2. 1999 Emissions Inventory for Baja California (Final)

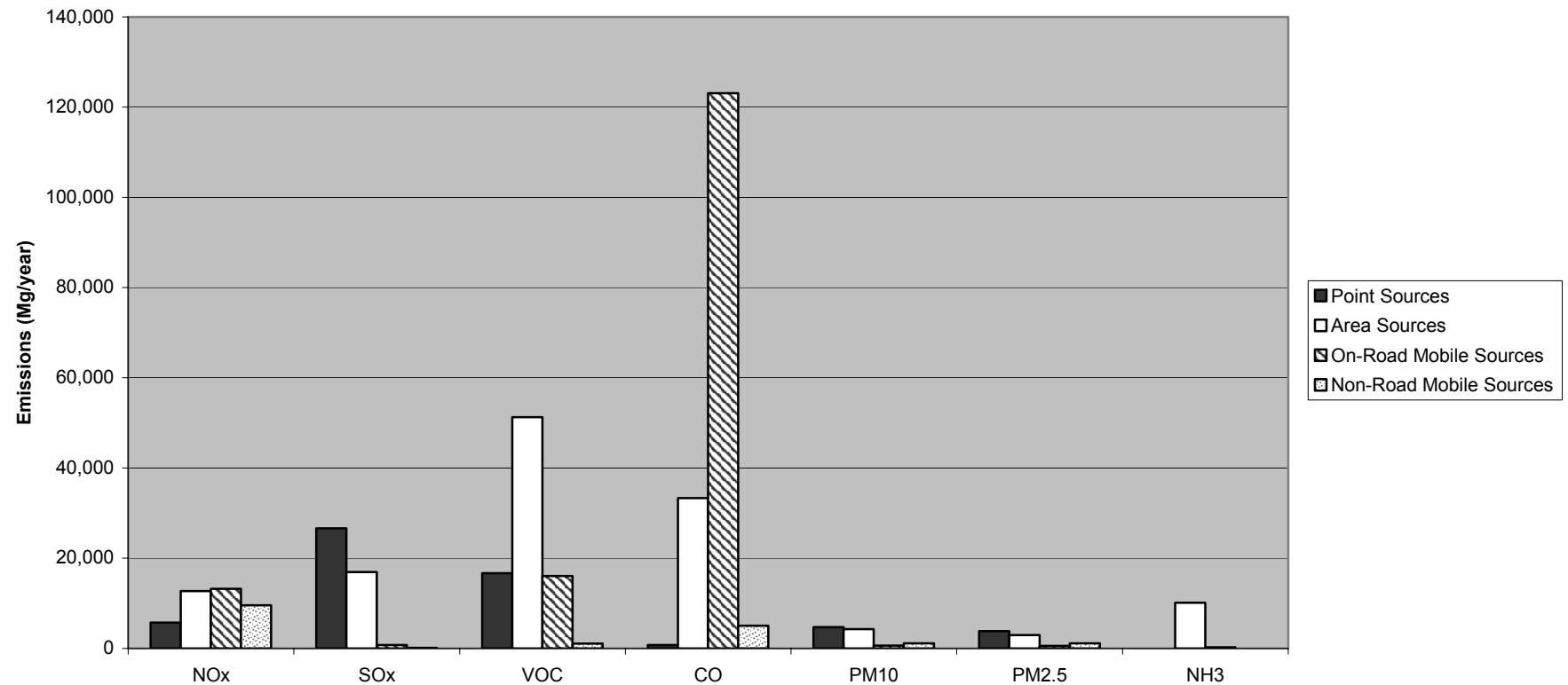


Figure G-3. 1999 Emissions Inventory for Baja California Sur (Final)

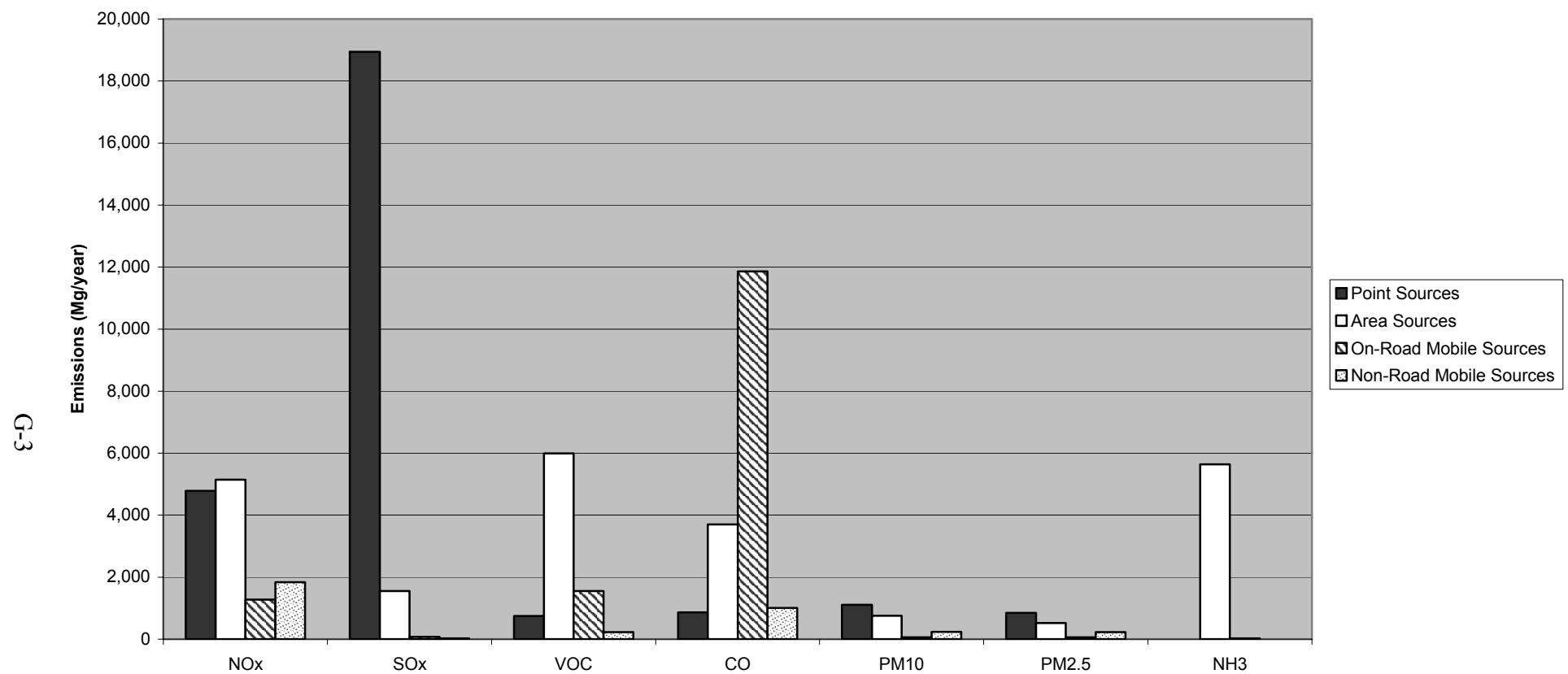


Figure G-4. 1999 Emissions Inventory for Campeche (Final)

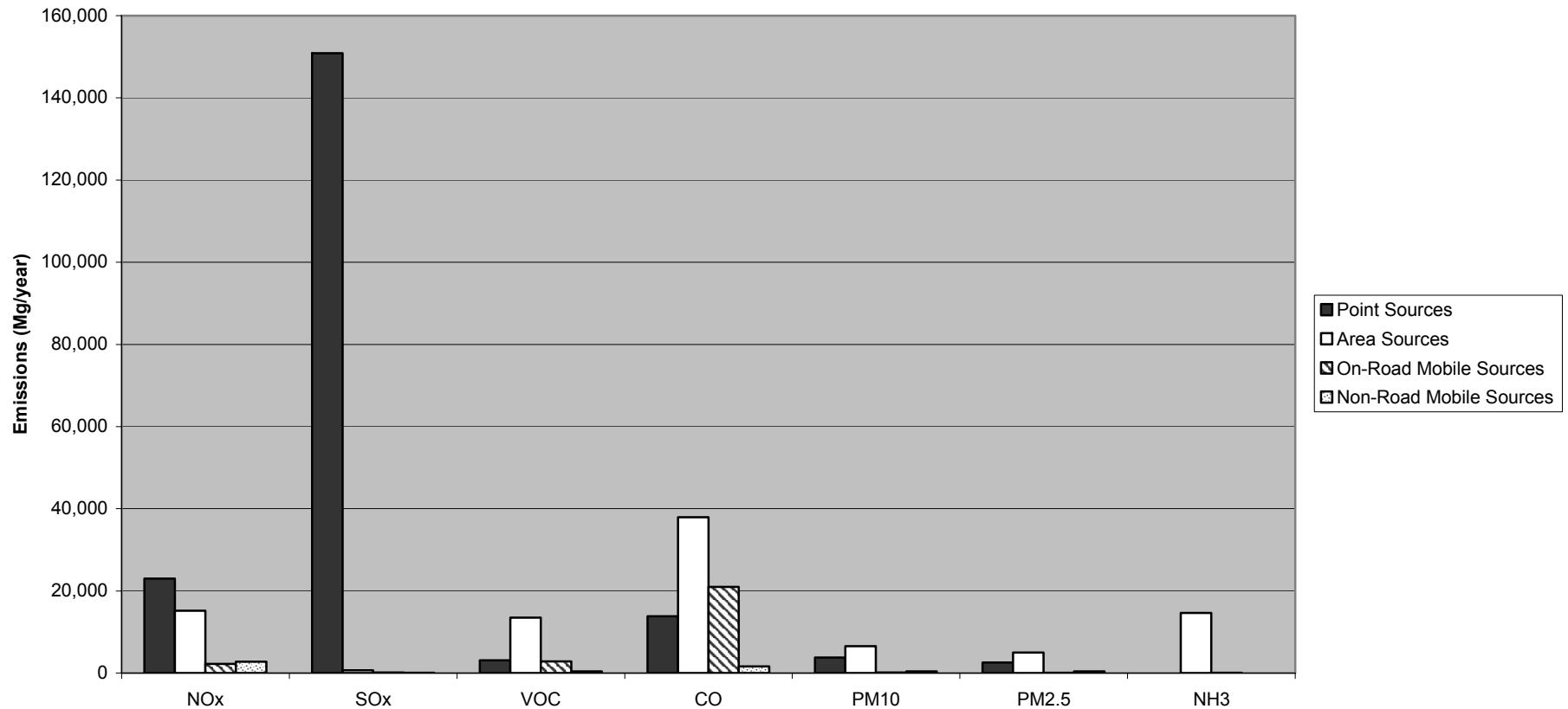


Figure G-5. 1999 Emissions Inventory for Coahuila (Final)

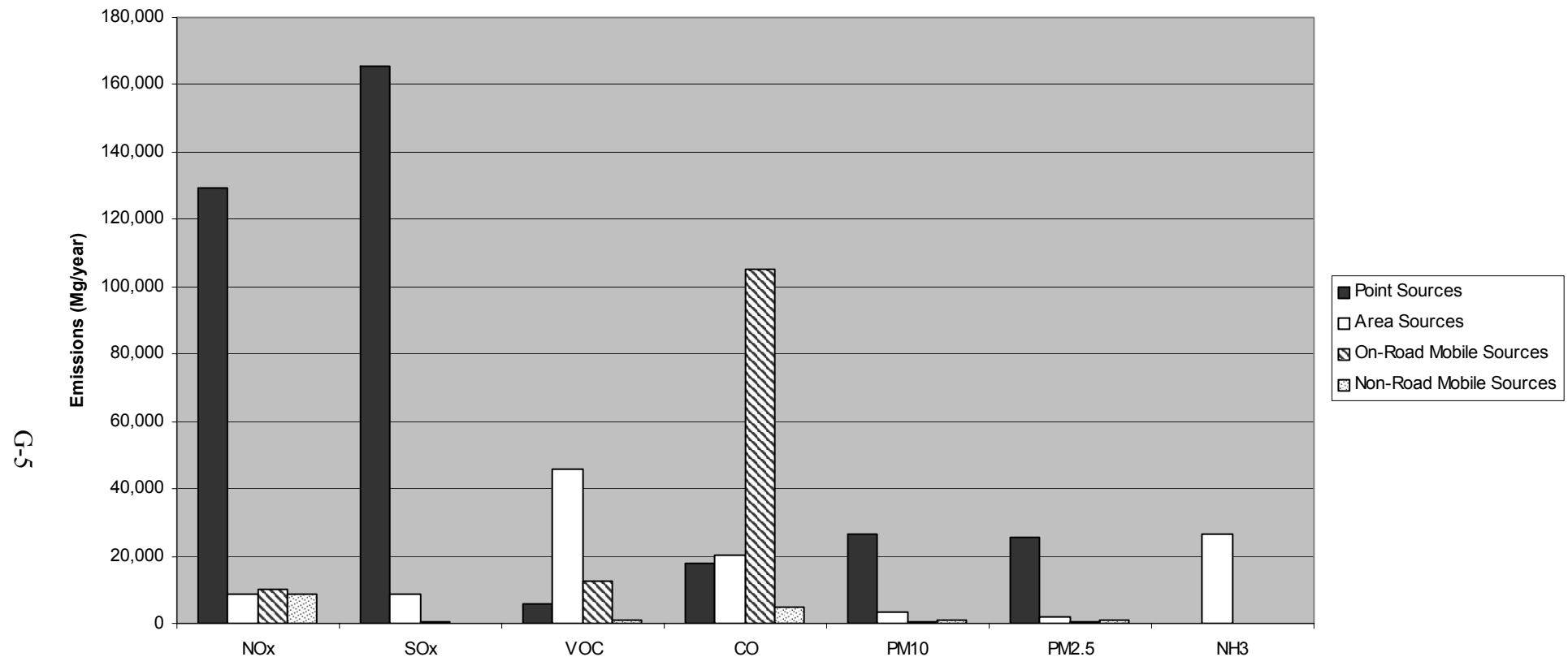


Figure G-6. 1999 Emissions Inventory for Colima (Final)

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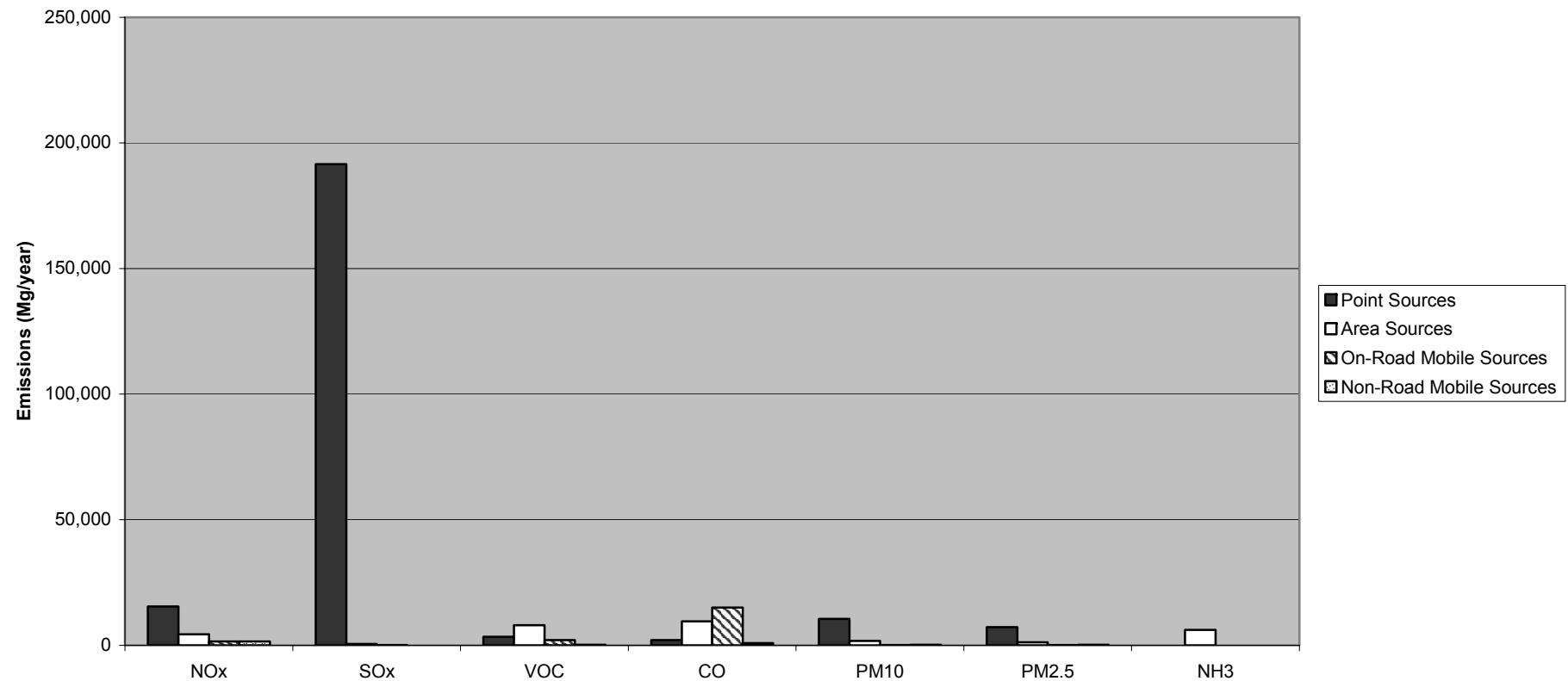


Figure G-7. 1999 Emissions Inventory for Chiapas (Final)

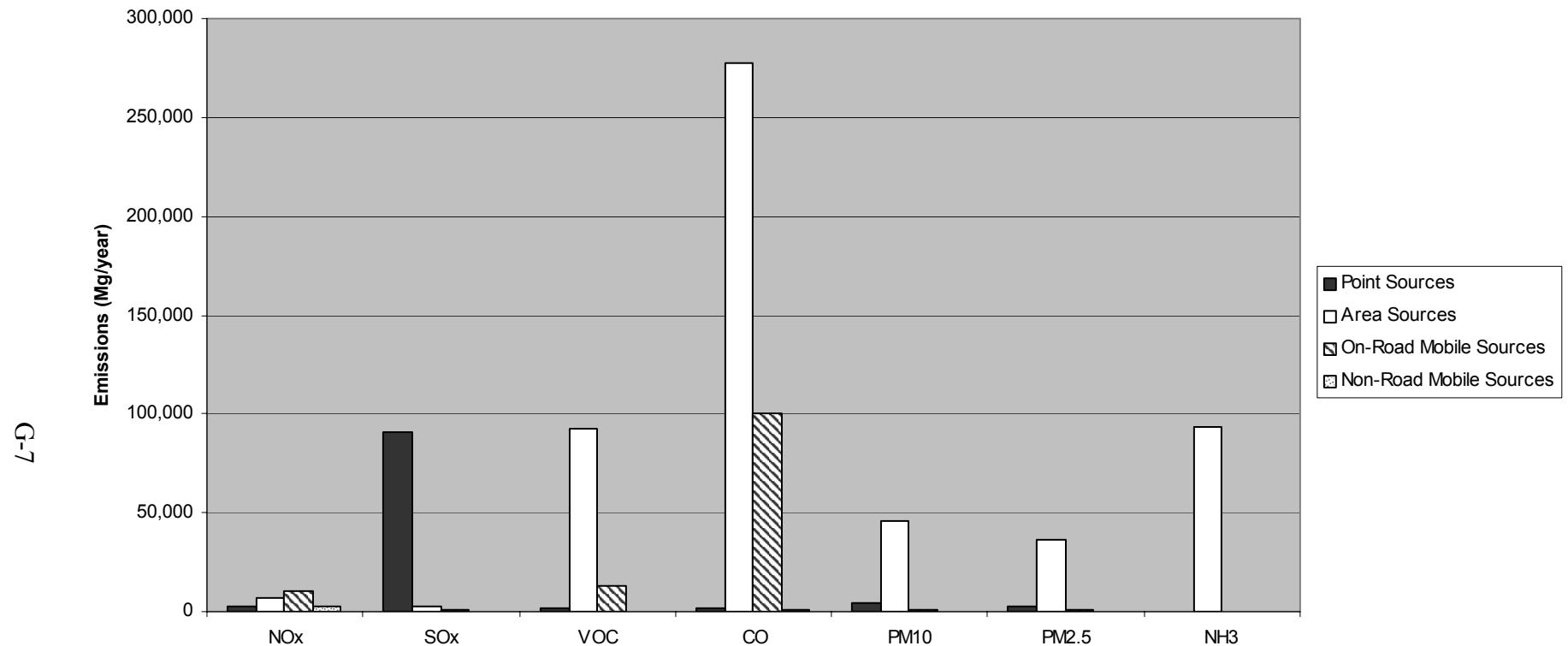


Figure G-8. 1999 Emissions Inventory for Chihuahua (Final)

G-8

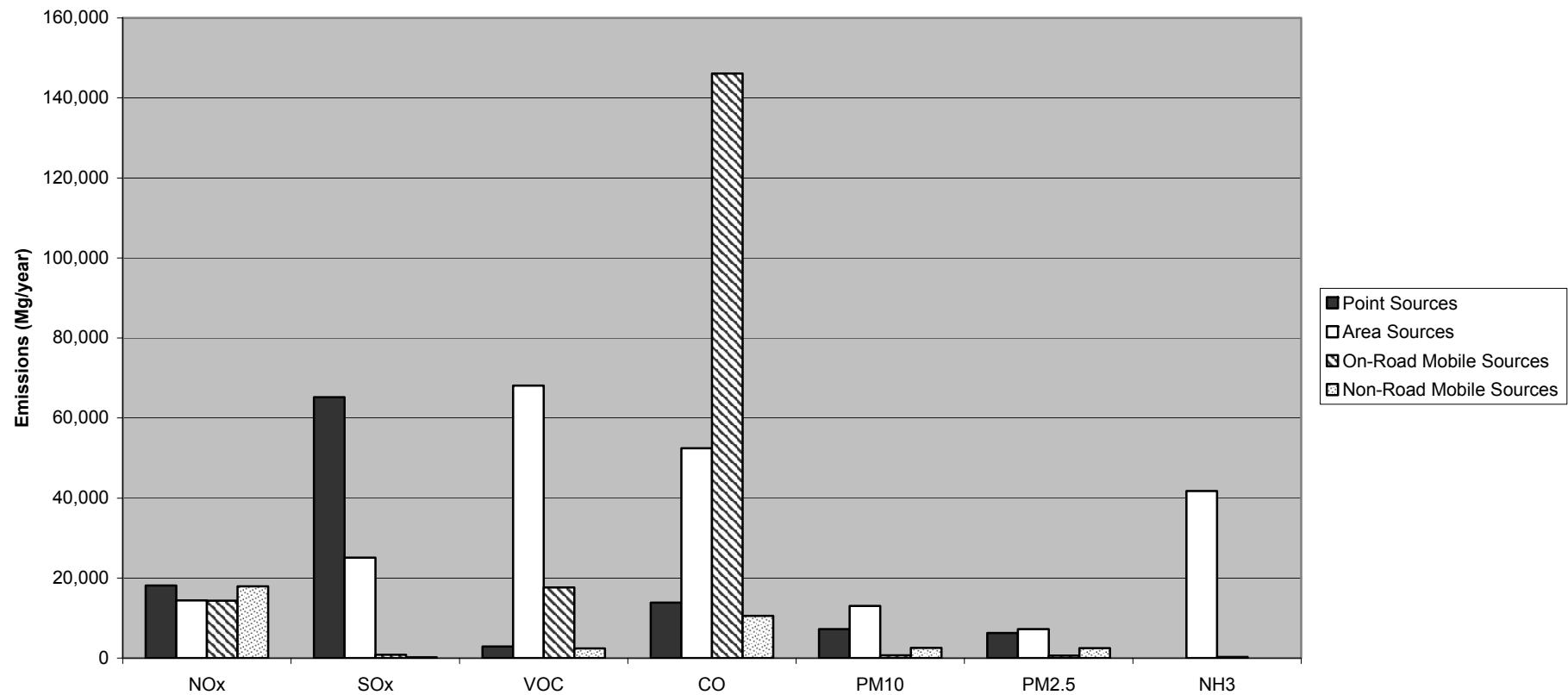


Figure G-9. 1999 Emissions Inventory for Distrito Federal (Final)

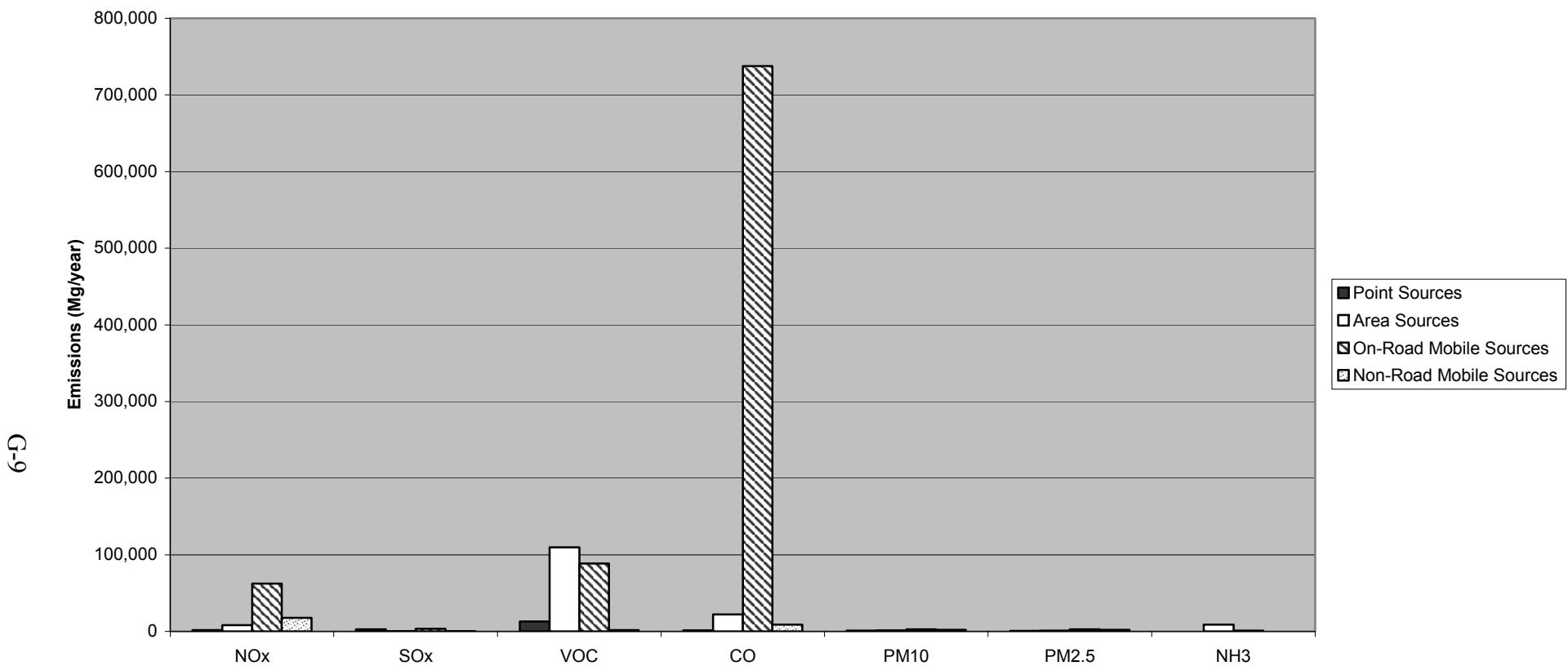


Figure G-10. 1999 Emissions Inventory for Durango (Final)

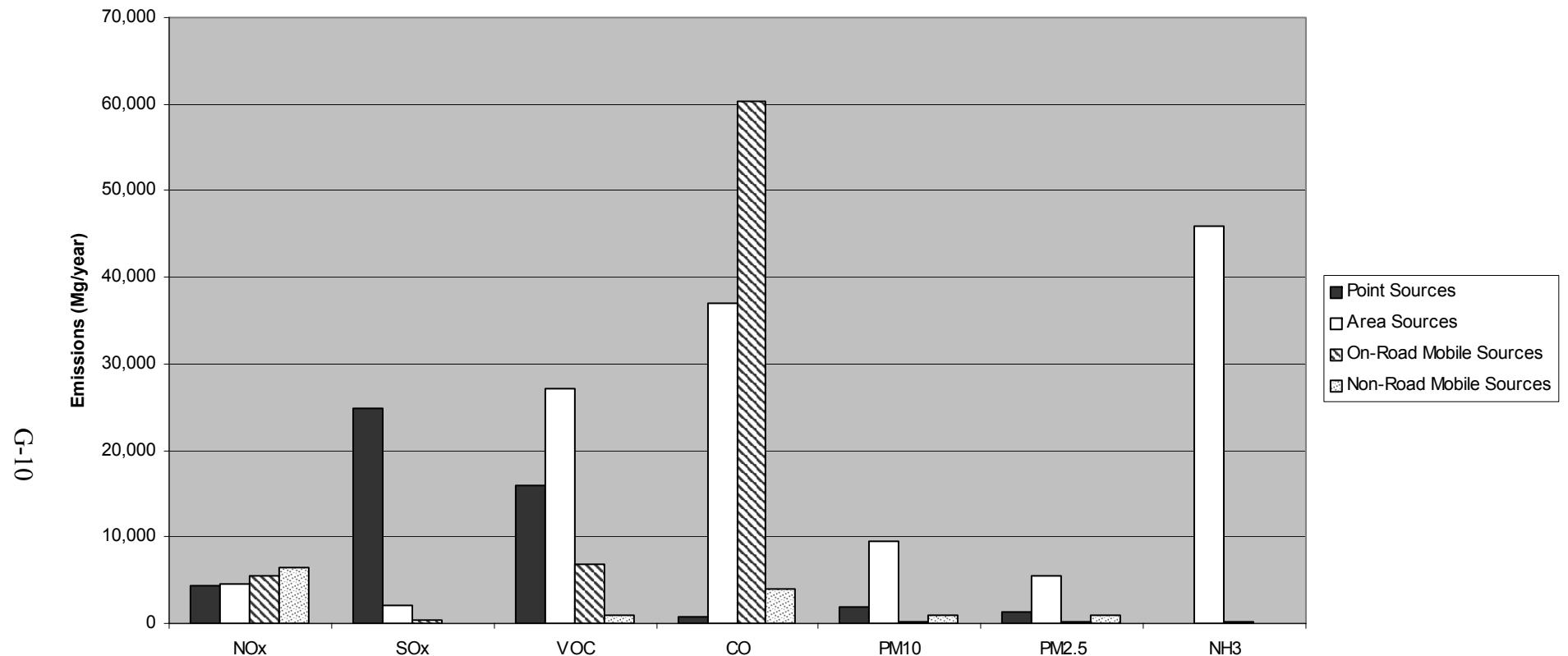
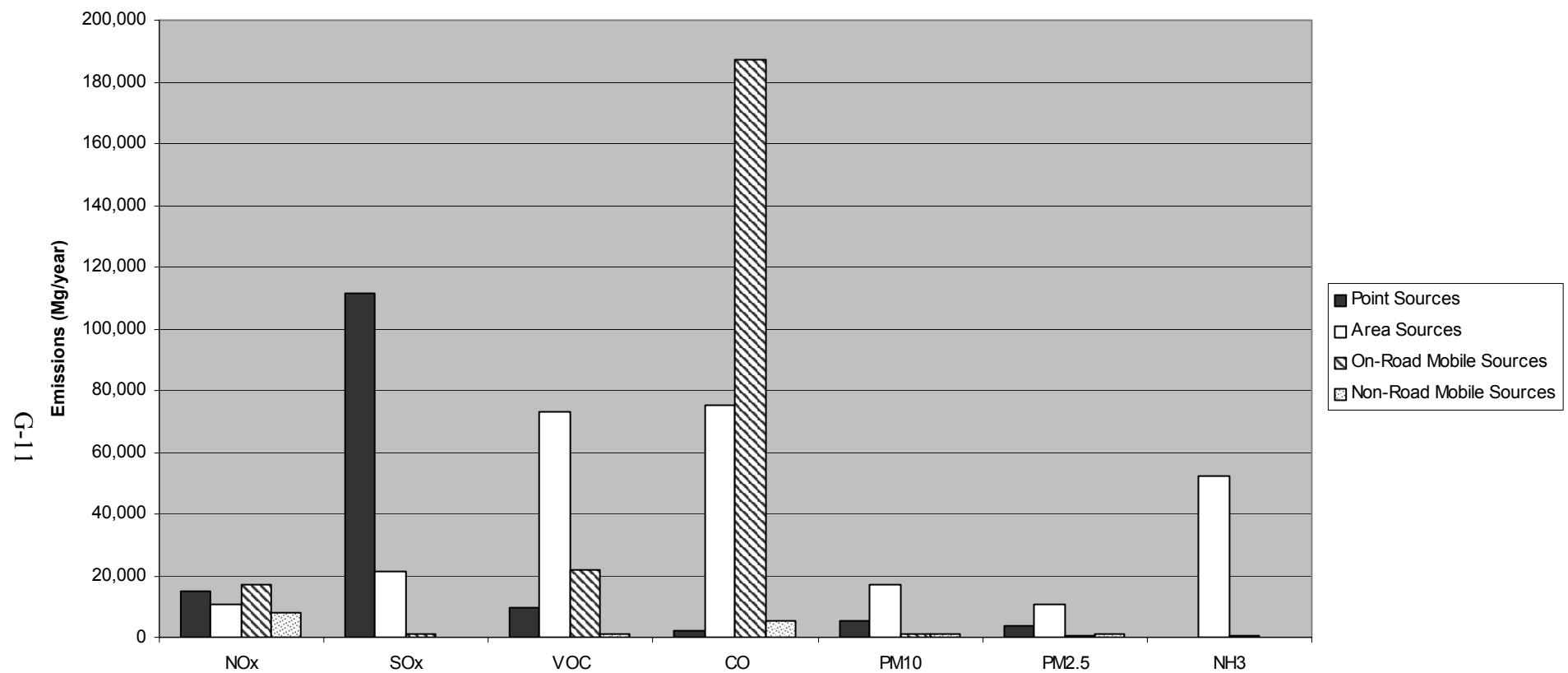


Figure G-11. 1999 Emissions Inventory for Guanajuato (Final)



G-12

Figure G-12. 1999 Emissions Inventory for Guerrero (Final)

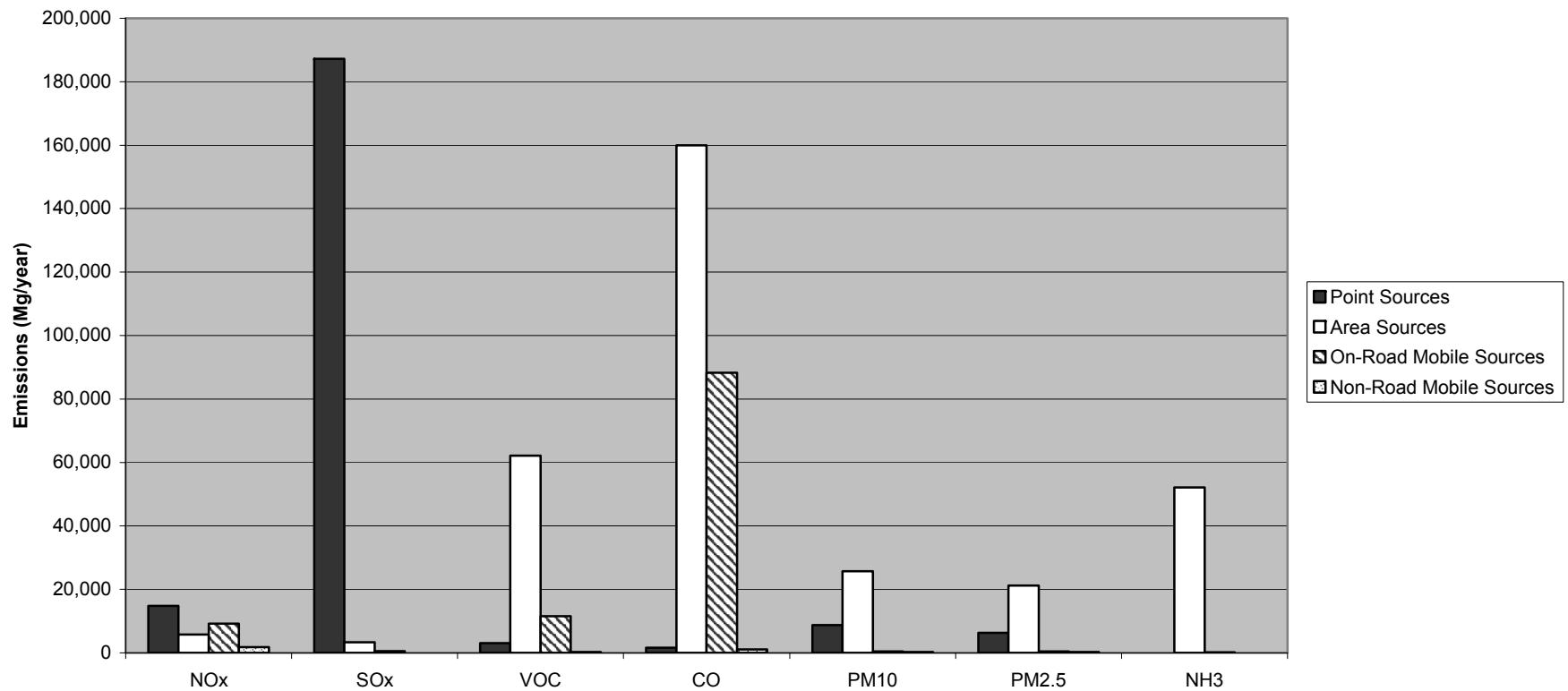


Figure G-13. 1999 Emissions Inventory for Hidalgo (Final)

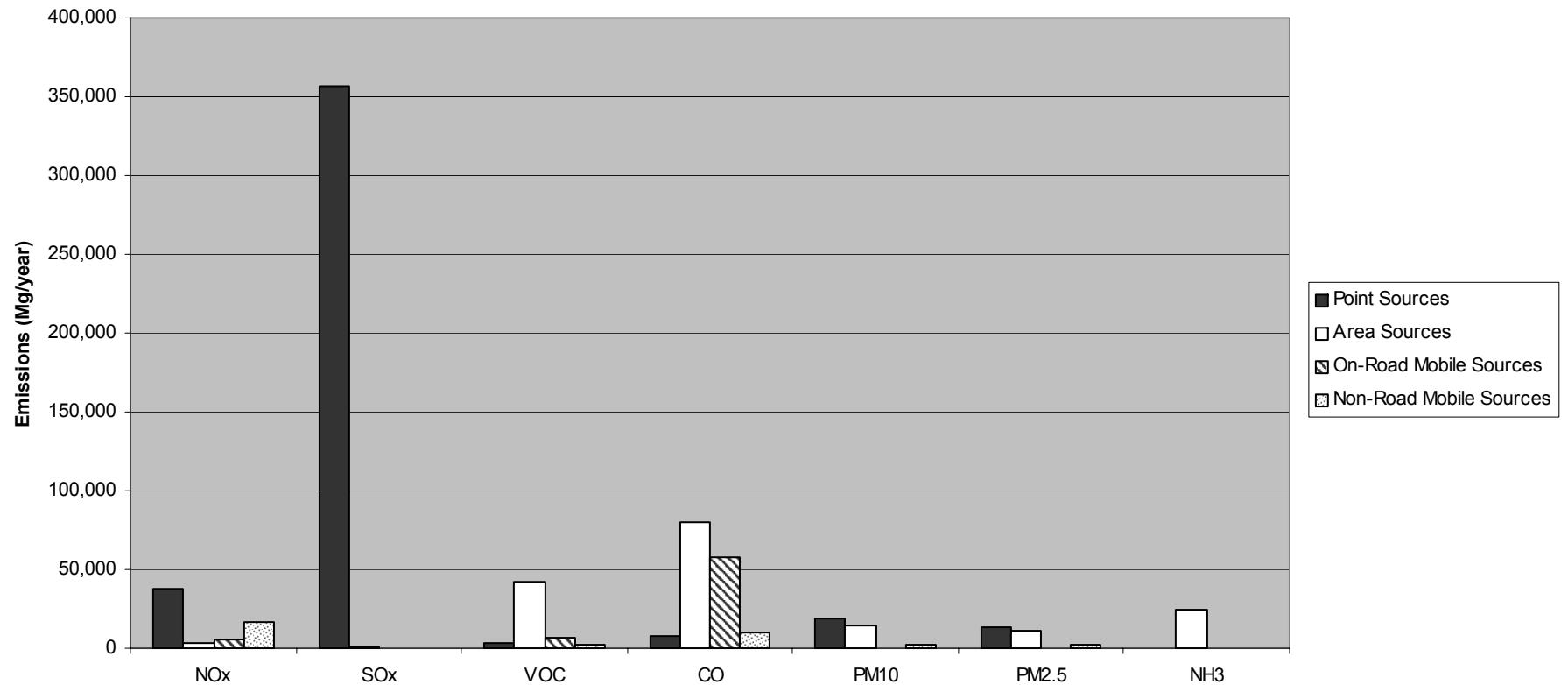


Figure G-14. 1999 Emissions Inventory for Jalisco (Final)

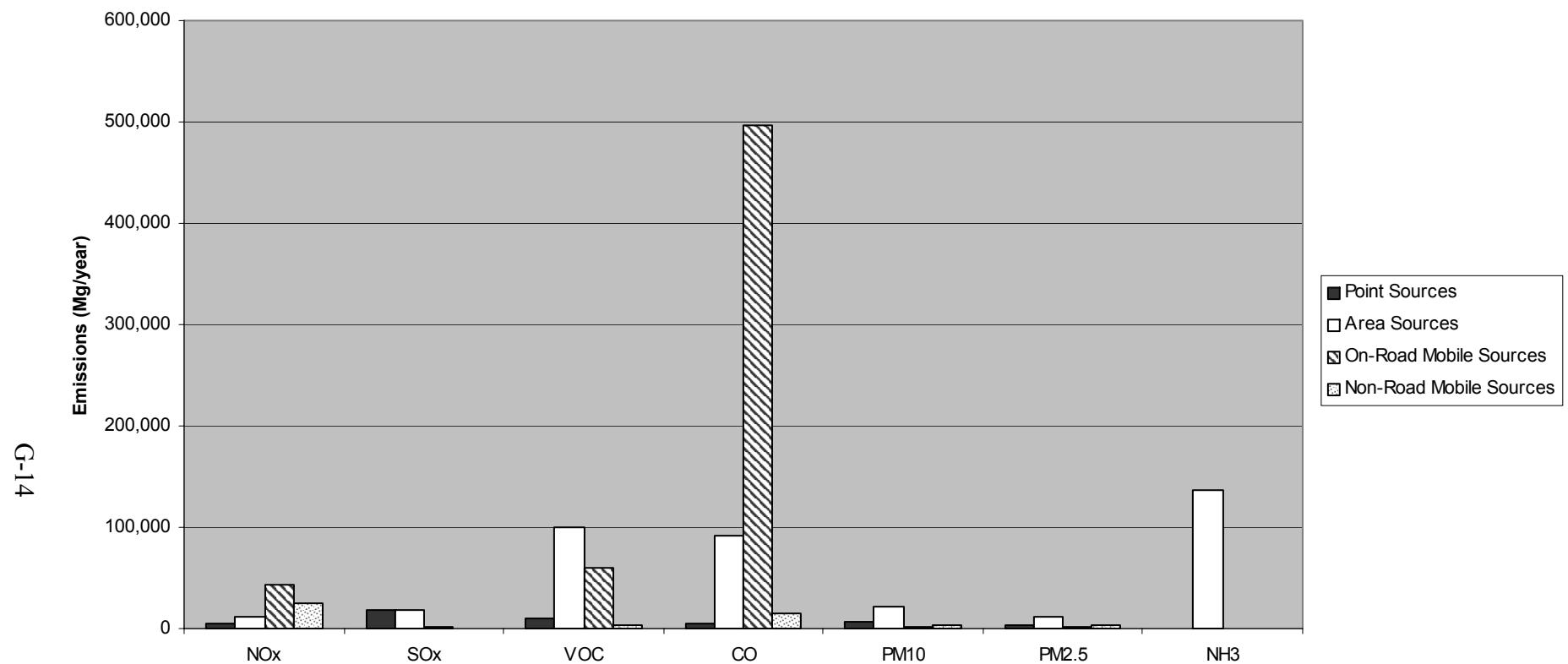
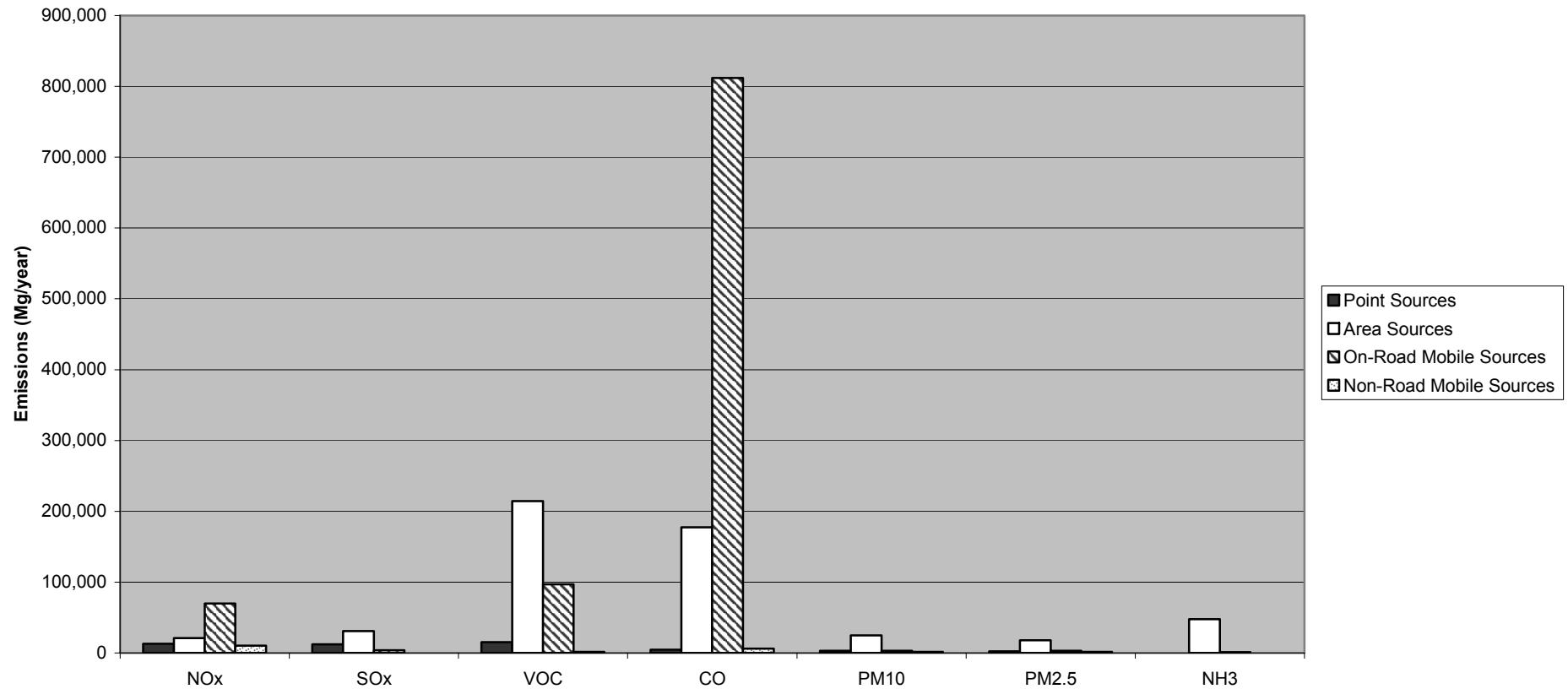


Figure G-15. 1999 Emissions Inventory for the State of México (Final)

G-15



G-16

Figure G-16. 1999 Emissions Inventory for Michoacán (Final)

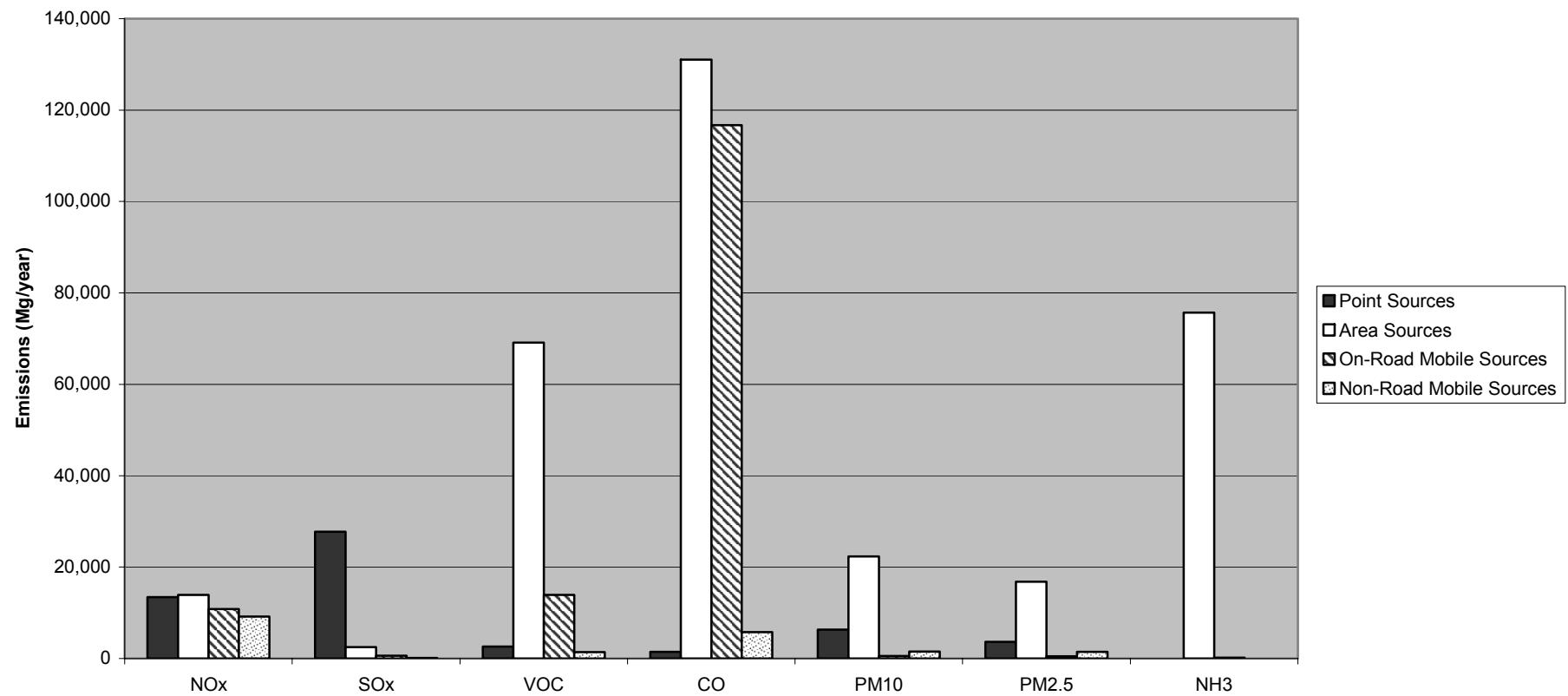


Figure G-17. 1999 Emissions Inventory for Morelos (Final)

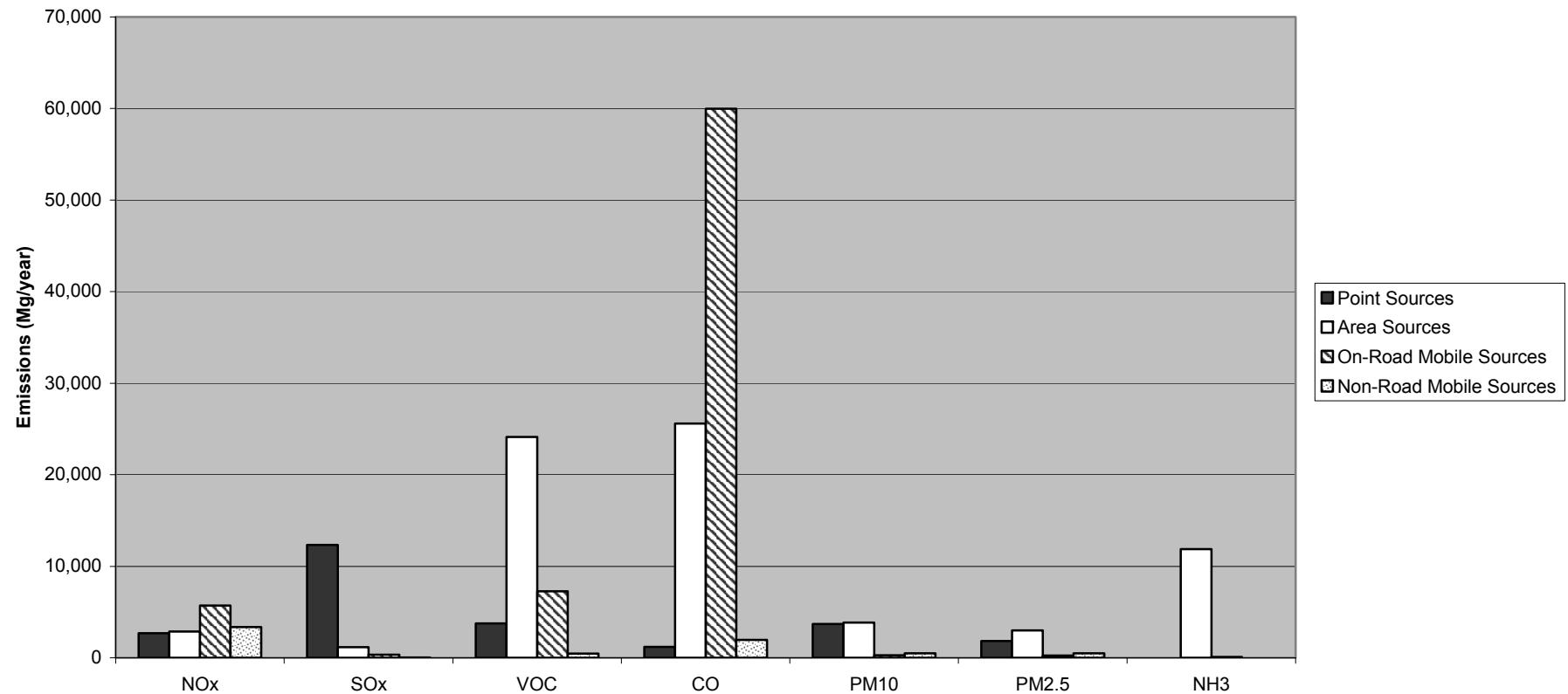


Figure G-18. 1999 Emissions Inventory for Nayarit (Final)

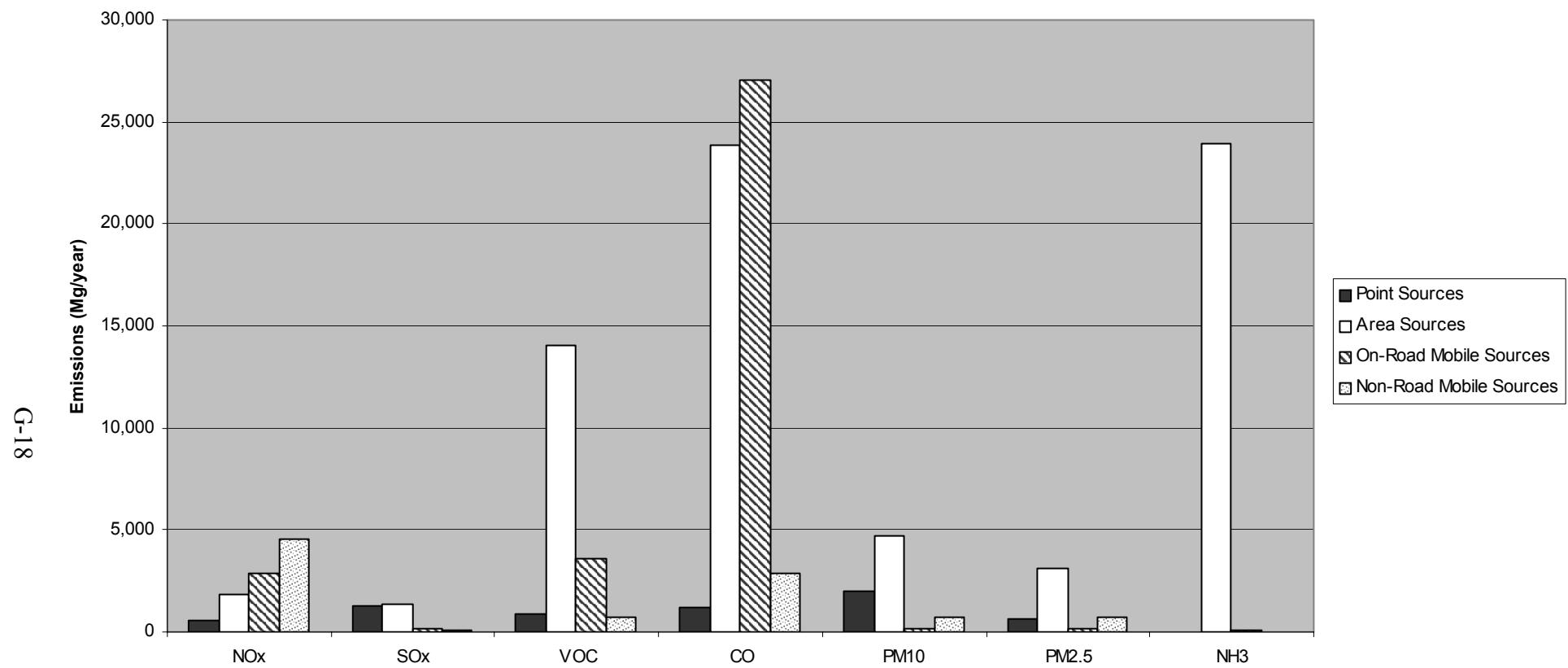


Figure G-19. 1999 Emissions Inventory for Nuevo León (Final)

G-19

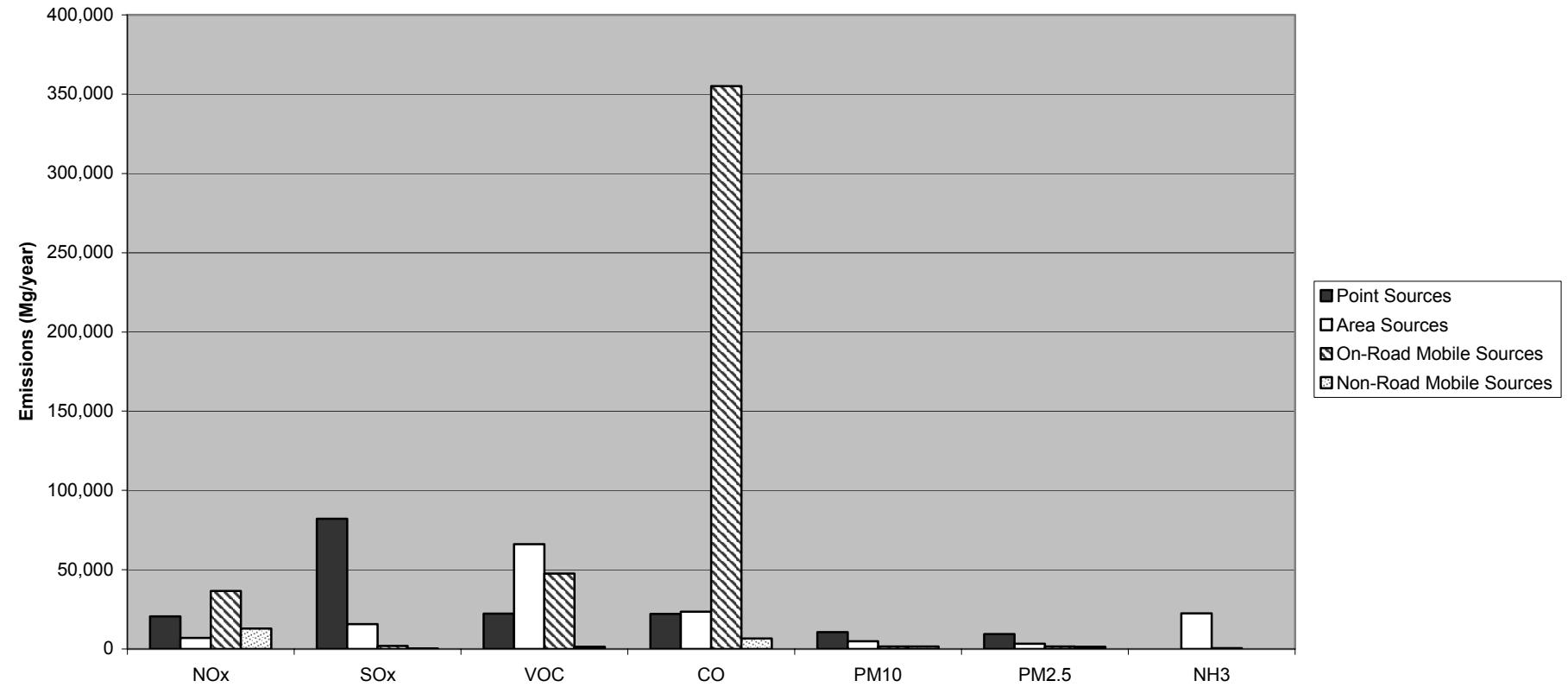


Figure G-20. 1999 Emissions Inventory for Oaxaca (Final)

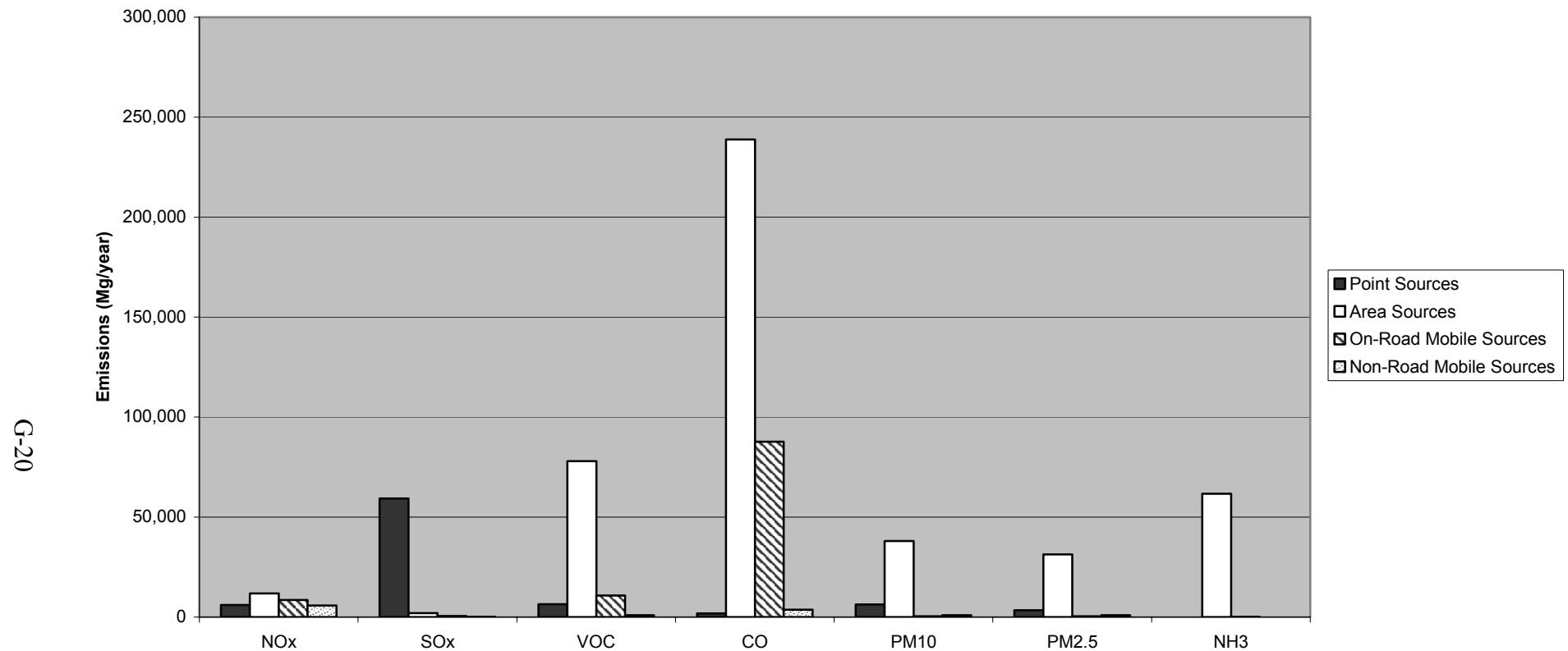


Figure G-21. 1999 Emissions Inventory for Puebla (Final)

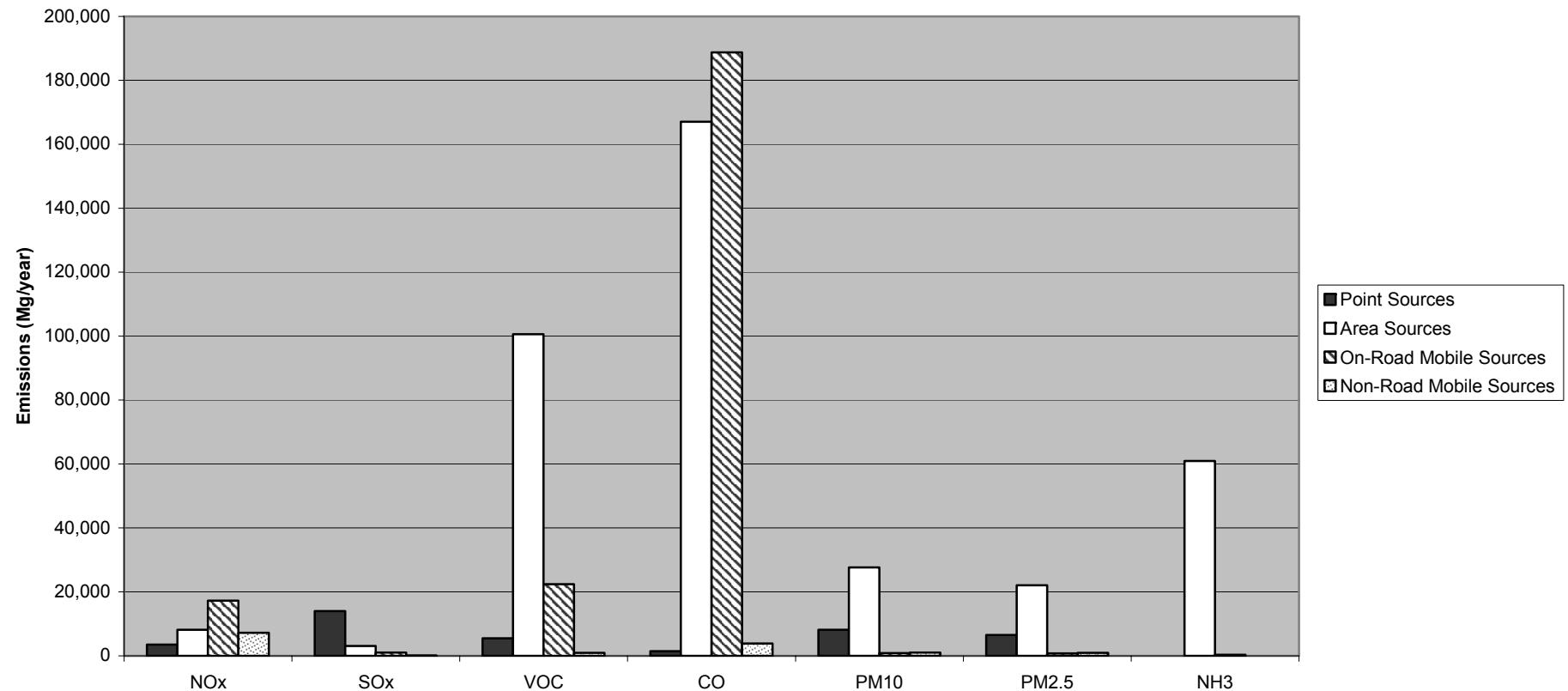
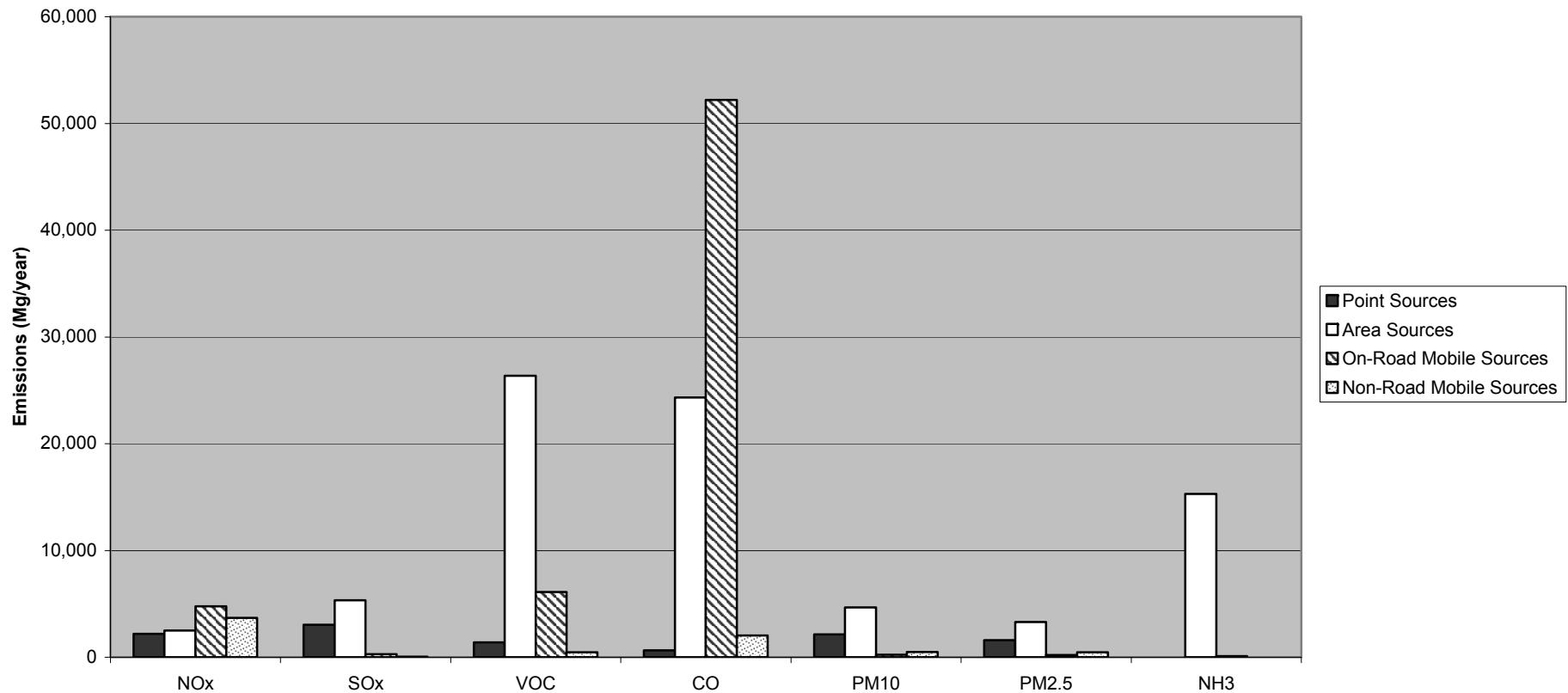


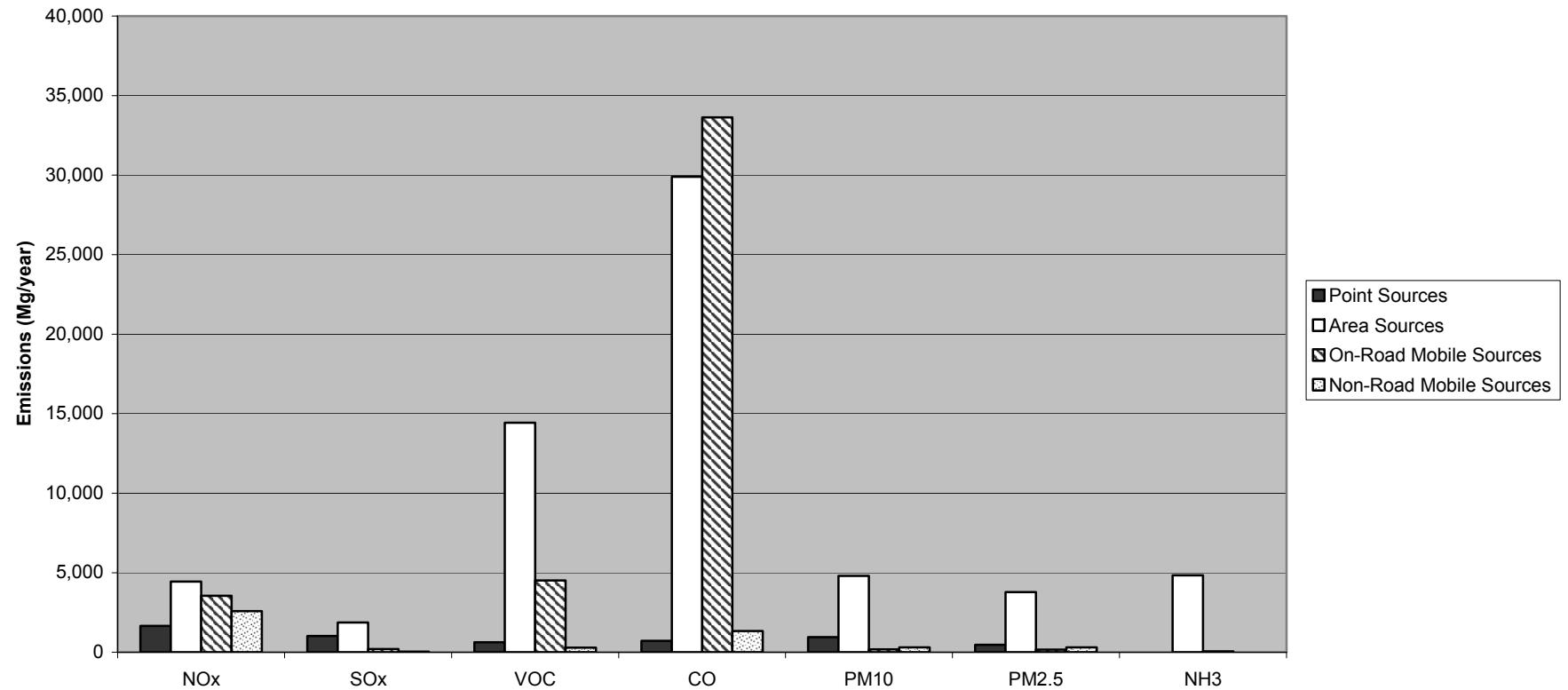
Figure G-22. 1999 Emissions Inventory for Querétaro (Final)

G-22



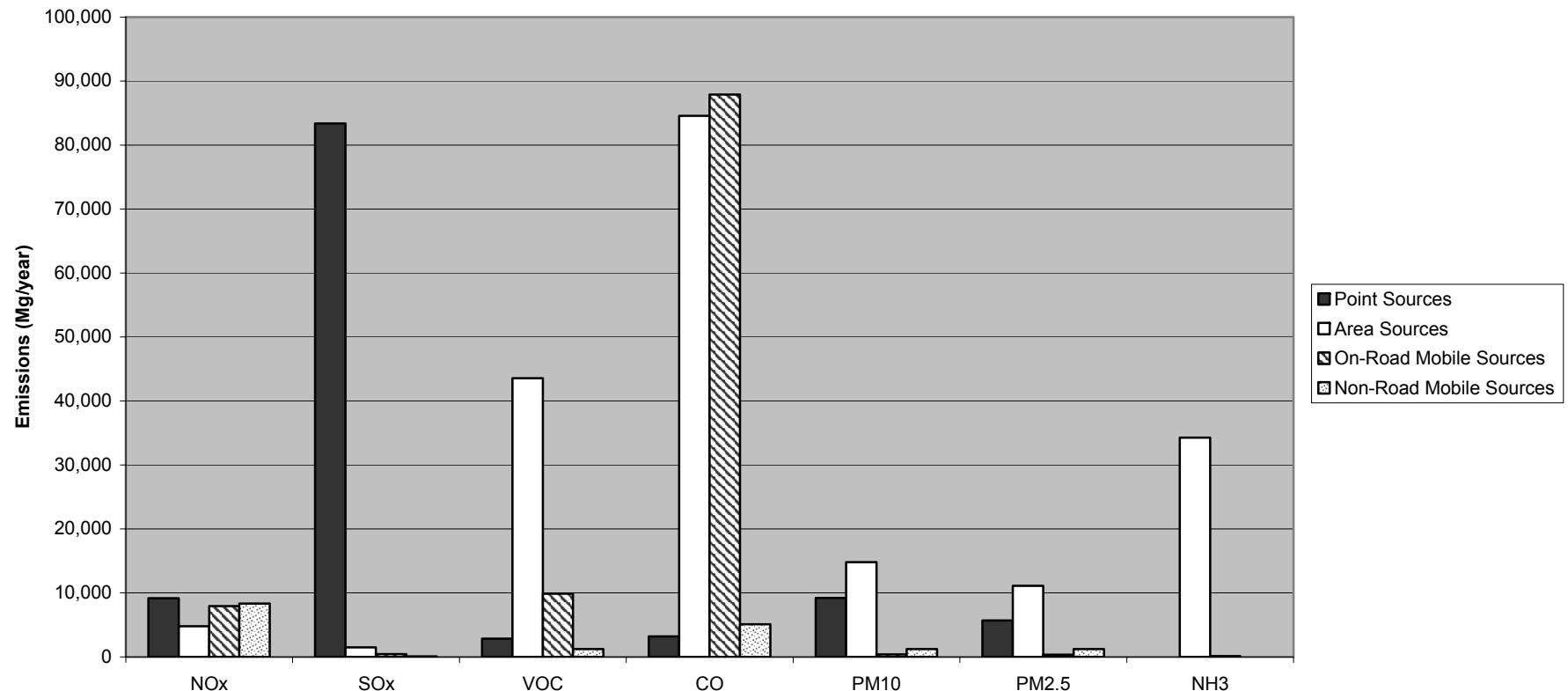
G-23

Figure G-23. 1999 Emissions Inventory for Quintana Roo (Final)



C-24

Figure G-24. 1999 Emissions Inventory for San Luis Potosí (Final)



G-25

Figure G-25. 1999 Emissions Inventory for Sinaloa (Final)

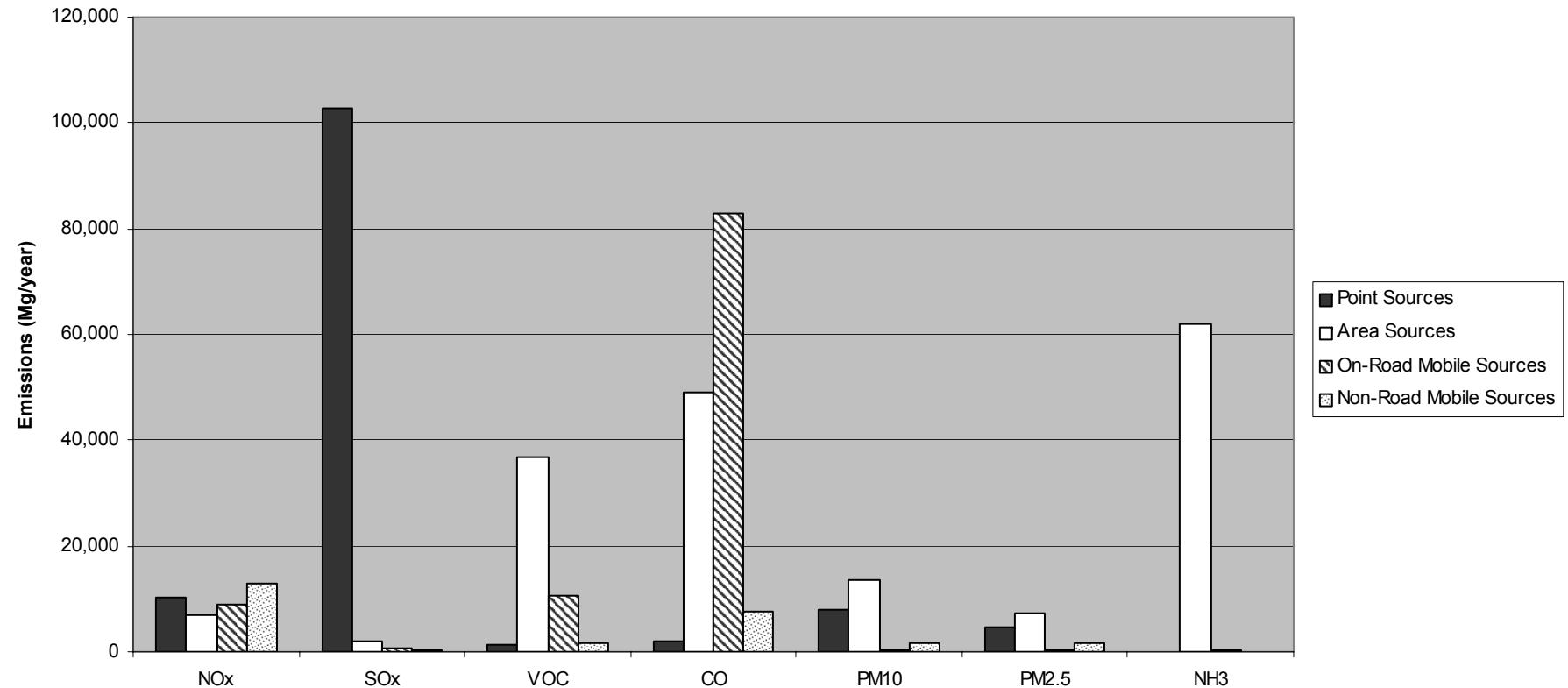


Figure G-26. 1999 Emissions Inventory for Sonora (Final)

C-26

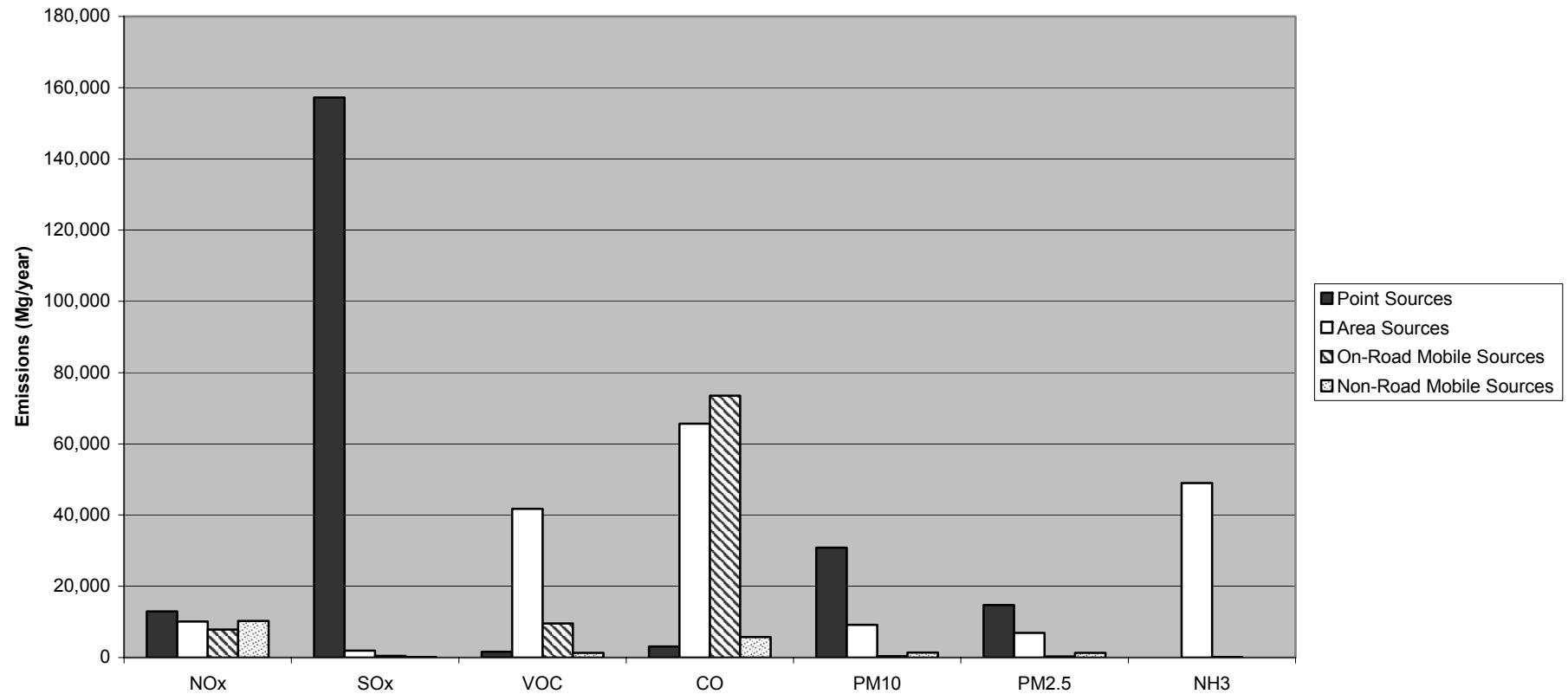


Figure G-27. 1999 Emissions Inventory for Tabasco (Final)

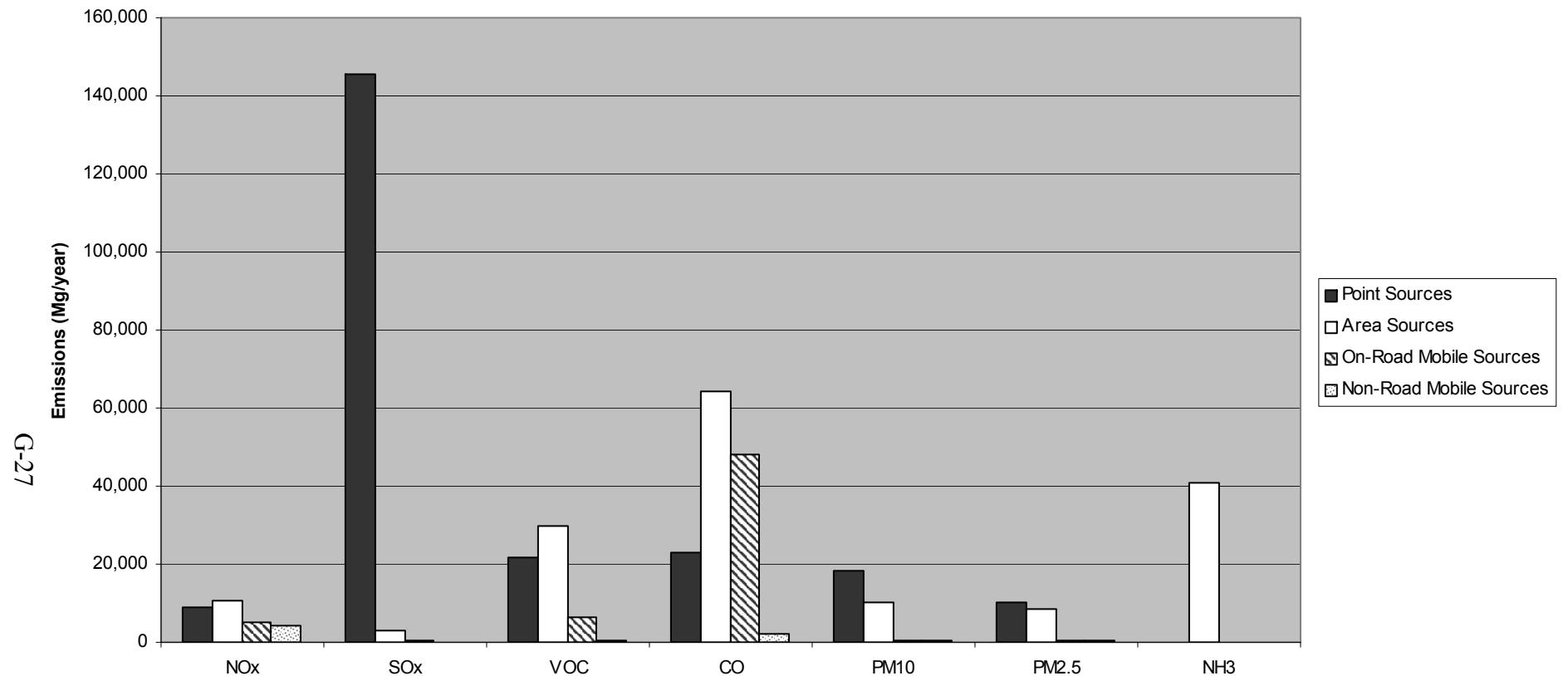


Figure G-28. 1999 Emissions Inventory for Tamaulipas (Final)

G-28

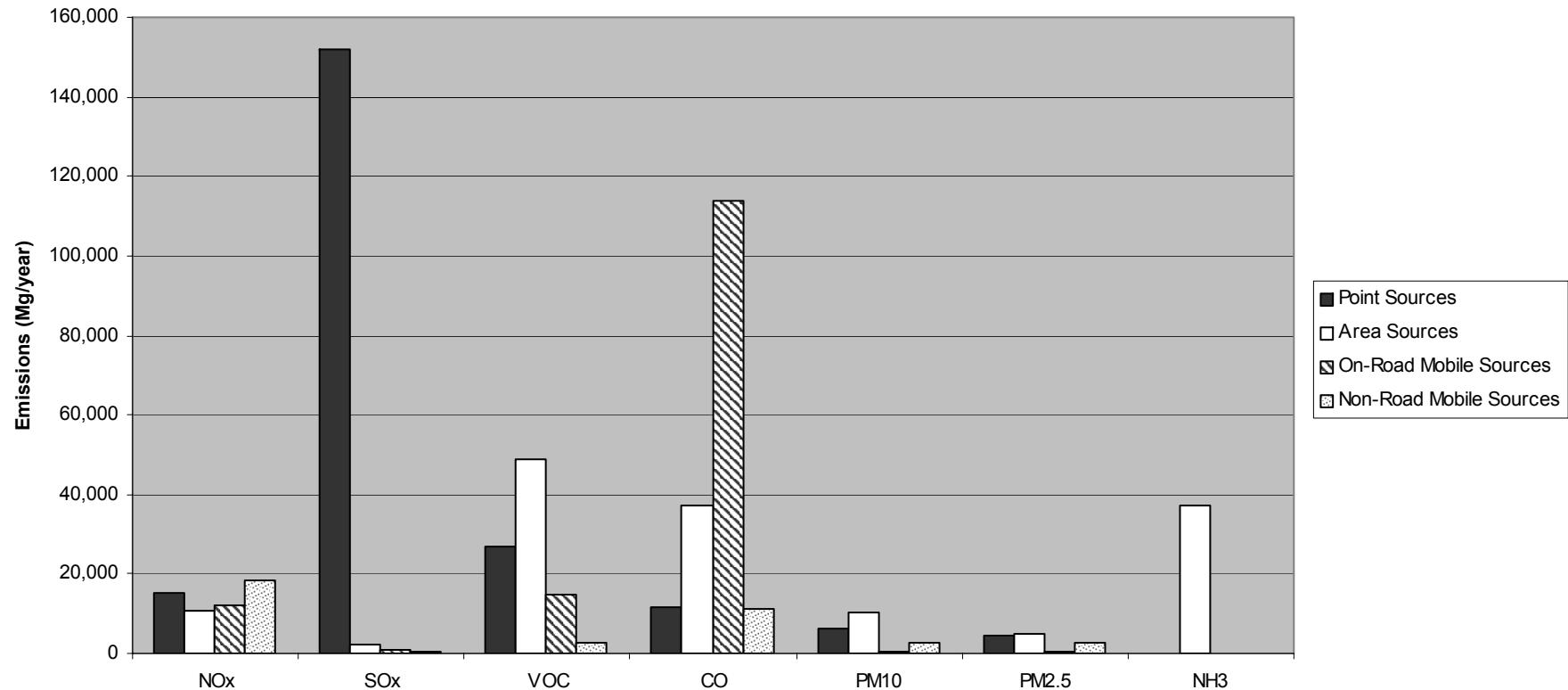


Figure G-29. 1999 Emissions Inventory for Tlaxcala (Final)

G-29

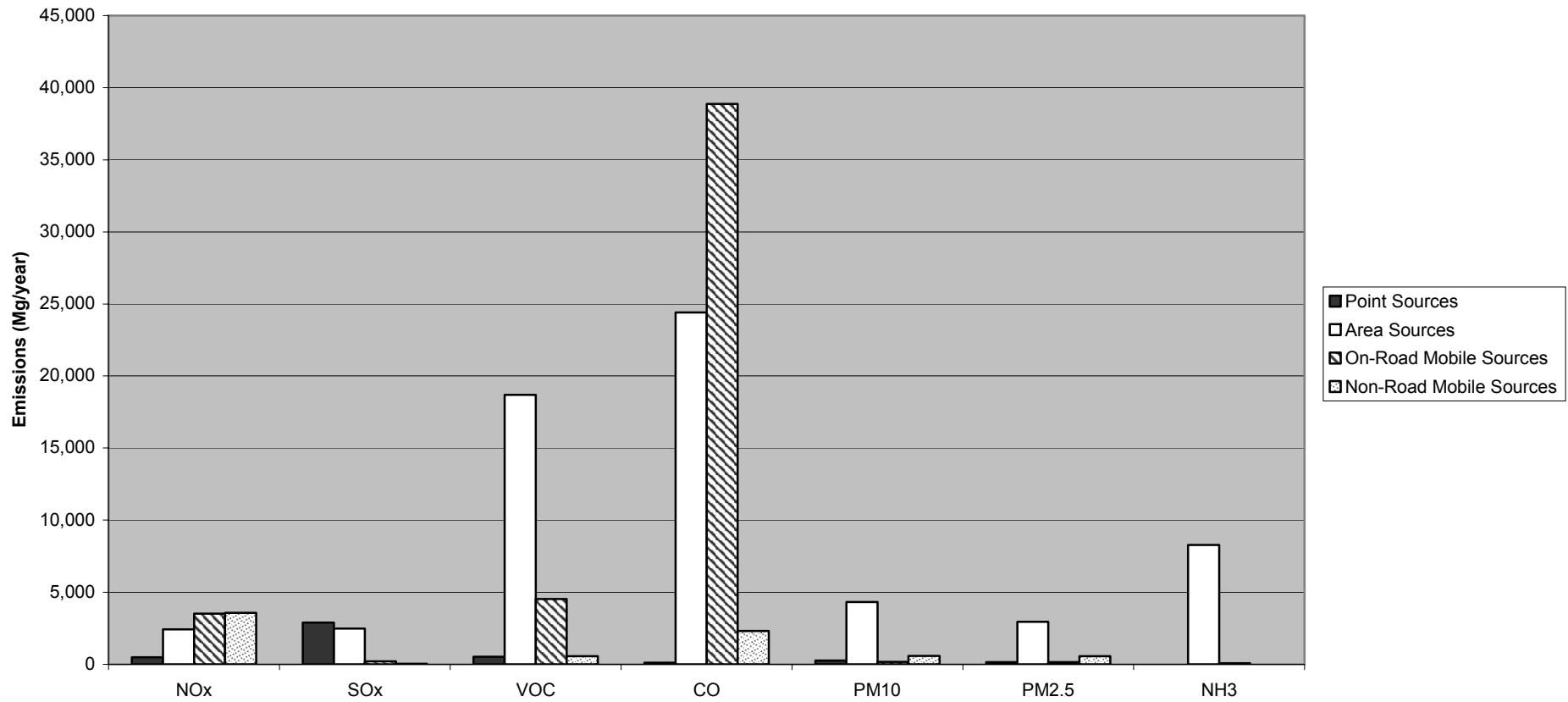


Figure G-30. 1999 Emissions Inventory for Veracruz (Final)

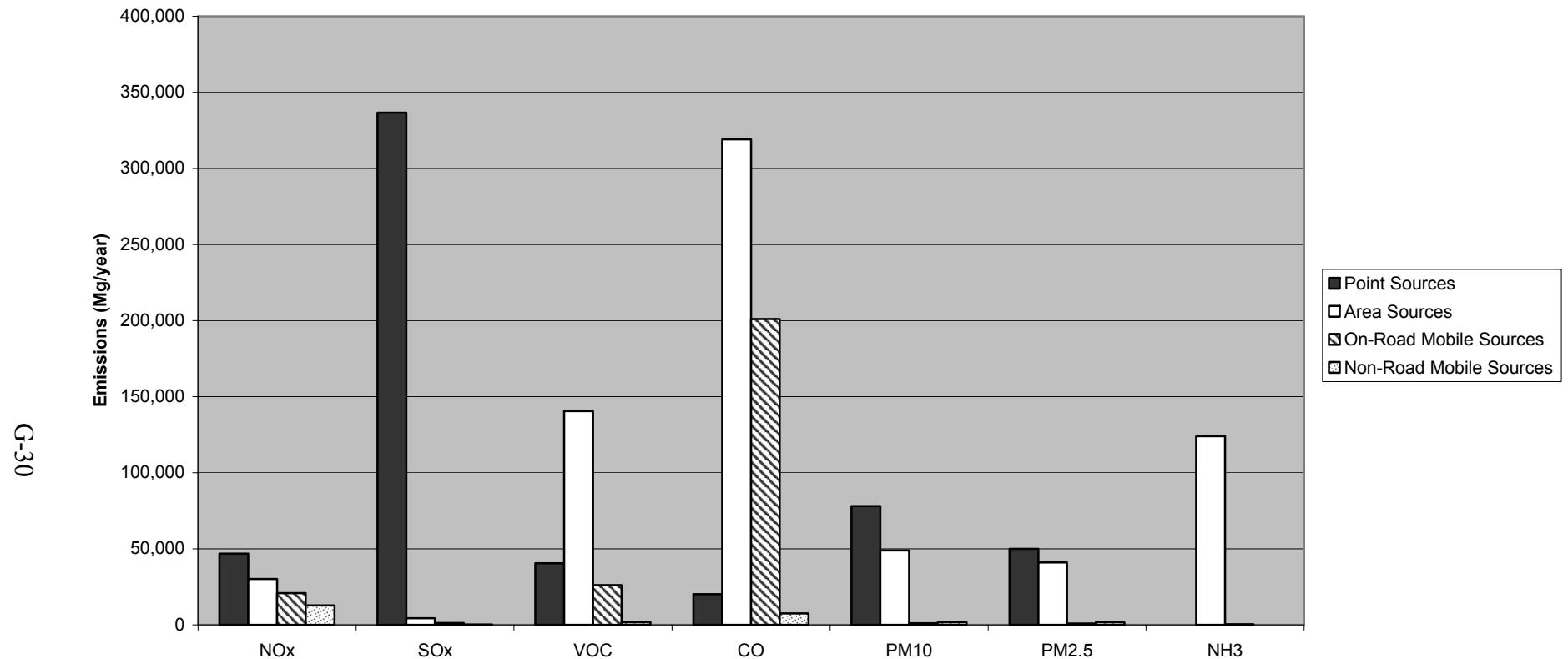


Figure G-31. 1999 Emissions Inventory for Yucatán (Final)

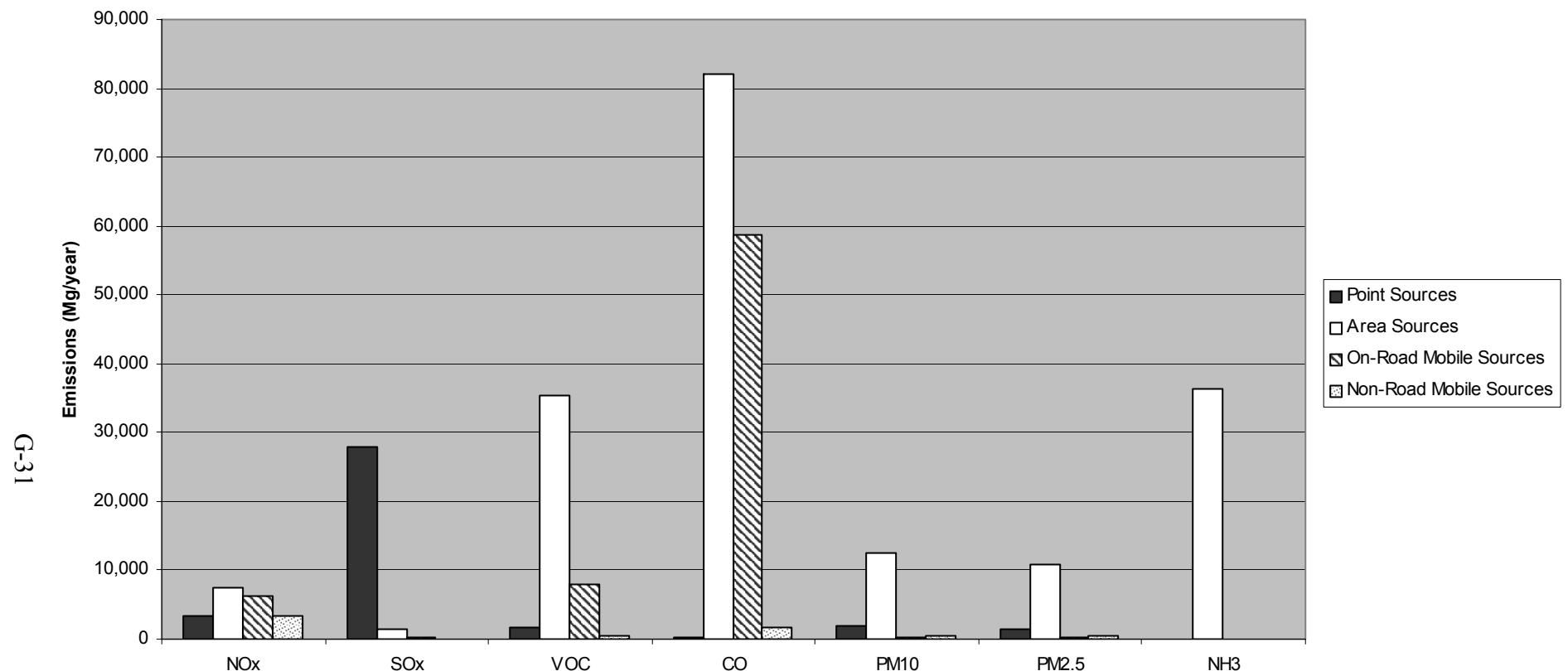
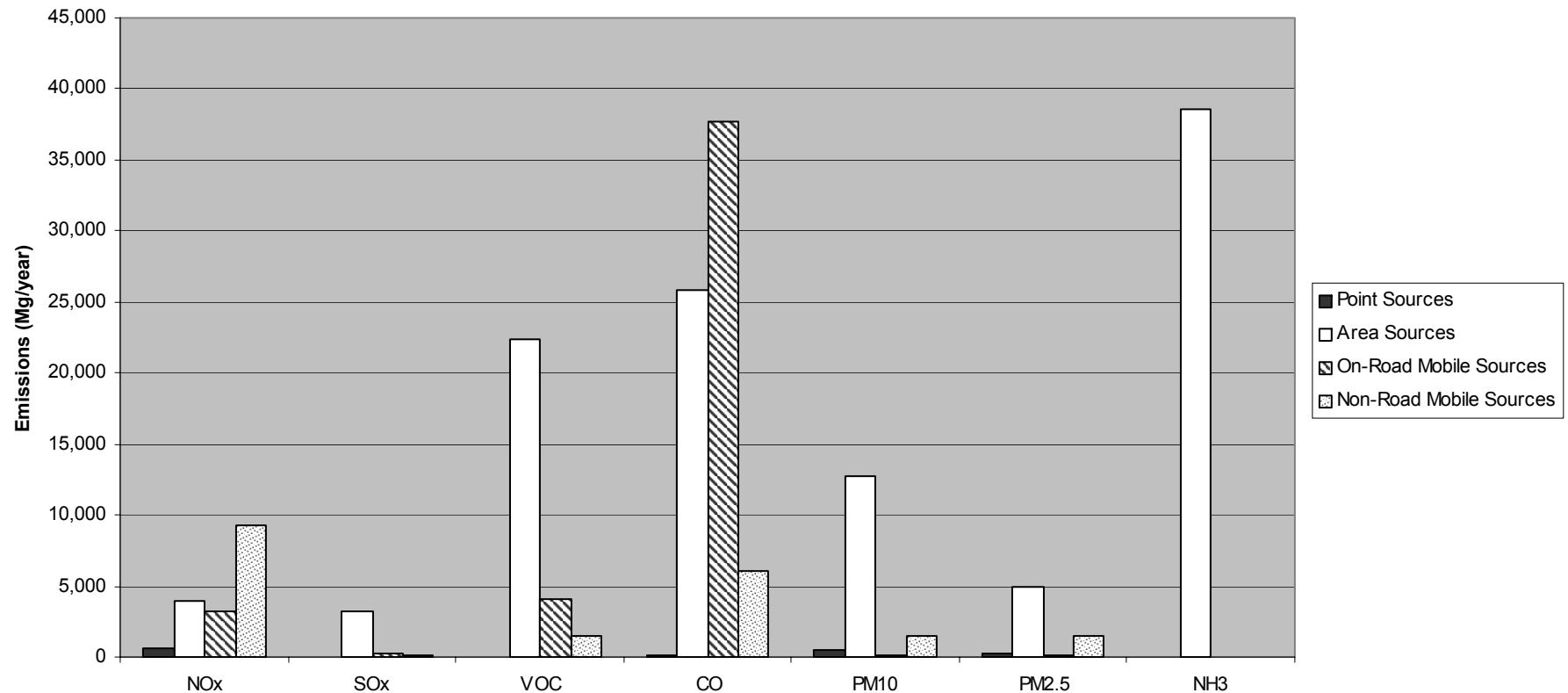


Figure G-32. 1999 Emissions Inventory for Zacatecas (Final)



APPENDIX H

**MUNICIPALITY LEVEL
EMISSIONS INVENTORY SUMMARIES
(EXCLUDING NATURAL SOURCES)**

1999 Mexico National Emissions Inventory (Final)
Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
Aguascalientes	Aguascalientes	1001	6,816.6	5,096.0	19,696.1	42,980.3	1,753.1	1,036.6	4,490.9
Aguascalientes	Asientos	1002	367.5	58.1	627.3	1,486.2	249.7	116.3	2,207.2
Aguascalientes	Calvillo	1003	260.7	72.2	808.8	1,947.2	172.3	112.0	384.0
Aguascalientes	Cosío	1004	195.3	31.5	211.6	490.9	79.6	41.0	392.4
Aguascalientes	Jesús María	1005	780.2	1,226.4	3,343.5	3,189.5	428.5	223.4	665.7
Aguascalientes	Pabellón de Arteaga	1006	234.4	113.9	565.0	1,113.0	155.8	61.8	2,551.5
Aguascalientes	Rincón de Romos	1007	469.4	143.5	1,003.4	1,510.1	182.6	100.8	2,759.7
Aguascalientes	San José de Gracia	1008	54.9	17.6	141.1	312.8	53.5	25.7	286.3
Aguascalientes	Tepezalá	1009	198.9	12.6	260.2	631.1	112.0	53.4	792.0
Aguascalientes	El Llano	1010	74.0	17.5	260.5	533.8	226.4	67.7	7,218.2
Aguascalientes	San Francisco de los Romo	1011	216.5	270.1	675.3	652.9	145.9	55.8	1,169.1
Aguascalientes Total			9,668.4	7,059.5	27,592.8	54,847.7	3,559.6	1,894.5	22,916.9
Baja California	Ensenada	2001	8,474.1	1,963.3	16,625.9	17,318.1	1,784.0	1,259.6	3,629.2
Baja California	Mexicali	2002	10,229.7	6,317.1	21,953.2	51,315.5	4,982.0	3,758.9	5,446.3
Baja California	Tecate	2003	724.2	692.7	2,137.6	2,512.3	143.9	119.4	88.2
Baja California	Tijuana	2004	16,915.3	11,535.4	42,176.1	88,945.1	2,161.4	1,688.3	1,127.2
Baja California	Playas de Rosarito	2005	4,870.1	23,891.9	2,177.8	2,115.6	1,708.2	1,673.5	71.9
Baja California Total			41,213.4	44,400.5	85,070.7	162,206.6	10,779.5	8,499.7	10,362.7
Baja California Sur	Comondú	3001	2,437.2	4,121.6	1,284.0	2,355.2	454.8	371.2	1,416.2
Baja California Sur	Mulegé	3002	5,222.2	433.0	915.8	2,009.8	299.9	275.8	945.0
Baja California Sur	La Paz	3003	4,161.0	15,643.8	4,518.9	9,707.9	1,235.2	844.8	1,523.0
Baja California Sur	Los Cabos	3008	834.3	366.9	1,590.2	2,938.0	145.5	129.1	1,539.7
Baja California Sur	Loreto	3009	387.0	34.9	206.1	431.6	30.6	27.7	244.8
Baja California Sur Total			13,041.7	20,600.2	8,515.0	17,442.5	2,165.9	1,648.6	5,668.7
Campeche	Calkiní	4001	428.3	28.3	1,201.7	4,088.4	503.5	441.4	243.9
Campeche	Campeche	4002	22,660.2	43,314.1	4,591.9	16,571.9	2,505.4	1,933.4	1,345.9
Campeche	Carmen	4003	16,997.3	107,709.0	6,335.8	25,030.7	3,323.2	2,397.6	3,254.9
Campeche	Champotón	4004	1,037.2	603.9	2,379.1	8,756.2	1,617.6	1,093.8	2,352.6
Campeche	Hecelchakán	4005	298.0	14.8	644.2	2,145.0	328.2	247.9	163.5
Campeche	Hopelchén	4006	487.2	19.3	1,170.5	4,440.8	740.2	546.1	530.6
Campeche	Palizada	4007	40.0	4.1	175.3	564.3	79.6	57.0	1,703.8
Campeche	Tenabo	4008	167.9	5.0	277.2	1,026.5	159.4	121.6	72.9
Campeche	Escárcega	4009	597.5	38.3	1,374.3	4,709.3	693.9	539.2	2,629.3
Campeche	Calakmul	4010	240.0	7.3	511.9	1,881.2	301.2	185.2	193.4
Campeche	Candelaria	4011	282.0	12.0	1,133.2	5,222.1	561.8	481.6	2,158.5
Campeche Total			43,235.6	151,756.1	19,795.2	74,436.5	10,814.0	8,044.8	14,649.5
Coahuila	Abasolo	5001	43.4	2.4	30.7	109.3	17.2	11.6	81.8

1999 Mexico National Emissions Inventory (Final)
Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Coahuila	Acuña	5002	1,300.3	1,107.7	3,987.8	6,059.1	221.9	156.1	1,247.8
Coahuila	Allende	5003	163.2	74.7	392.7	565.4	36.8	23.8	138.8
Coahuila	Arteaga	5004	213.6	50.9	448.9	1,196.9	163.8	84.2	389.7
Coahuila	Candela	5005	14.0	4.2	40.7	62.4	24.9	8.5	185.0
Coahuila	Castaños	5006	324.5	124.7	720.7	725.6	109.3	57.7	361.4
Coahuila	Cuatrociéneas	5007	362.8	124.0	252.0	515.5	261.8	154.0	278.4
Coahuila	Escobedo	5008	86.6	2.2	52.2	127.9	17.2	11.5	201.4
Coahuila	Francisco I. Madero	5009	531.5	74.0	739.9	1,414.1	84.6	79.6	1,144.4
Coahuila	Frontera	5010	821.0	346.2	2,152.1	4,026.8	120.3	96.0	130.0
Coahuila	General Cepeda	5011	264.8	8.9	259.1	687.4	105.1	64.7	797.1
Coahuila	Guerrero	5012	18.5	1.3	40.3	63.2	13.2	5.3	783.4
Coahuila	Hidalgo	5013	13.0	3.3	72.0	46.4	181.4	42.1	384.8
Coahuila	Jiménez	5014	217.9	14.6	179.2	324.0	36.6	23.7	605.3
Coahuila	Juárez	5015	13.3	0.6	54.7	52.1	39.9	10.8	257.5
Coahuila	Lamadrid	5016	13.7	4.7	31.0	56.6	4.2	3.0	58.0
Coahuila	Matamoros	5017	825.6	100.9	1,309.0	2,623.0	131.0	122.7	2,577.4
Coahuila	Monclova	5018	25,008.0	11,199.6	9,390.6	14,085.4	14,485.7	14,222.4	432.3
Coahuila	Morelos	5019	57.0	26.6	140.6	204.7	14.2	9.4	242.3
Coahuila	Múzquiz	5020	623.7	366.7	1,063.0	1,833.9	113.7	87.4	1,329.1
Coahuila	Nadadores	5021	76.4	3.8	98.6	229.9	25.3	16.4	159.7
Coahuila	Nava	5022	104,009.3	151,166.0	563.6	3,144.3	8,249.0	8,075.5	336.6
Coahuila	Ocampo	5023	789.6	168.9	354.3	1,379.4	229.4	142.7	854.9
Coahuila	Parras	5024	853.2	132.7	963.8	2,006.2	180.9	139.3	911.0
Coahuila	Piedras Negras	5025	1,481.3	780.1	4,460.6	6,857.5	217.3	175.8	329.6
Coahuila	Progreso	5026	71.0	30.3	72.0	115.5	44.9	15.1	322.3
Coahuila	Ramos Arizpe	5027	2,509.6	679.9	3,732.3	7,480.3	417.8	322.6	1,087.1
Coahuila	Sabinas	5028	503.7	193.0	1,310.9	1,371.3	94.6	60.3	531.5
Coahuila	Sacramento	5029	13.5	1.9	31.3	74.0	8.2	4.8	82.9
Coahuila	Saltillo	5030	6,967.0	2,370.2	15,671.6	43,727.3	4,292.3	3,890.6	1,639.3
Coahuila	San Buenaventura	5031	146.4	18.3	308.6	612.3	38.8	28.7	751.6
Coahuila	San Juan de Sabinas	5032	376.2	999.8	901.8	1,090.8	86.1	51.8	194.1
Coahuila	San Pedro	5033	983.7	163.2	1,506.2	3,046.6	203.0	190.2	931.6
Coahuila	Sierra Mojada	5034	317.5	24.7	123.2	252.9	23.2	19.7	321.1
Coahuila	Torreón	5035	6,558.1	4,647.1	13,011.6	40,245.5	1,193.0	821.9	3,671.1
Coahuila	Viesca	5036	321.0	22.2	336.3	748.3	57.8	54.8	1,185.9
Coahuila	Villa Unión	5037	122.7	13.0	114.8	197.7	22.7	14.2	486.3
Coahuila	Zaragoza	5038	183.0	36.8	282.4	464.5	41.8	29.6	1,416.4
Coahuila Total			157,199.7	175,089.9	65,201.0	147,824.1	31,608.8	29,328.4	26,838.9

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1999 Mexico National Emissions Inventory (Final)
Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Colima	Armería	6001	345.4	23.1	583.6	1,400.2	134.9	121.5	229.1
Colima	Colima	6002	1,046.6	222.2	2,677.0	6,782.8	418.0	230.7	1,729.3
Colima	Comala	6003	109.6	10.6	376.3	1,011.9	117.0	87.3	477.1
Colima	Coquimatlán	6004	189.9	10.6	375.1	1,111.0	175.3	126.6	411.4
Colima	Cuauhémoc	6005	532.9	1,545.5	743.0	1,963.1	1,024.5	527.0	813.1
Colima	Ixtlahuacán	6006	39.0	2.6	137.6	386.4	50.8	39.6	207.0
Colima	Manzanillo	6007	19,196.5	189,841.8	5,457.9	6,261.1	9,808.9	7,053.6	834.9
Colima	Minatitlán	6008	53.1	4.7	289.2	559.6	65.6	52.7	214.8
Colima	Tecomán	6009	853.1	421.3	1,671.3	3,857.6	553.1	422.9	948.2
Colima	Villa de Alvarez	6010	592.3	66.5	1,343.0	4,168.1	147.2	110.7	298.4
Colima Total			22,958.6	192,149.0	13,654.0	27,501.7	12,495.2	8,772.6	6,163.3
Chiapas	Acacoyagua	7001	54.4	6.5	391.7	1,414.8	176.8	152.7	327.0
Chiapas	Acala	7002	124.0	16.0	783.5	2,913.9	457.4	326.0	545.4
Chiapas	Acapetahua	7003	156.3	13.3	596.8	2,068.6	249.8	212.5	620.1
Chiapas	Altamirano	7004	78.2	9.9	489.7	1,647.7	221.9	171.9	471.1
Chiapas	Amatán	7005	79.0	7.7	676.8	2,581.0	360.6	299.3	772.1
Chiapas	Amatenango de la Frontera	7006	128.0	8.4	881.0	3,612.0	445.1	385.2	147.7
Chiapas	Amatenango del Valle	7007	25.9	8.5	189.8	648.5	91.1	69.5	80.6
Chiapas	Angel Albino Corzo	7008	104.5	20.4	714.0	2,594.0	351.7	277.7	1,431.0
Chiapas	Arriaga	7009	245.5	122.0	842.1	2,689.1	337.7	260.0	1,927.6
Chiapas	Bejucal de Ocampo	7010	25.2	2.0	188.5	726.0	92.7	78.2	41.0
Chiapas	Bella Vista	7011	76.9	6.4	633.2	2,480.9	312.7	274.2	128.9
Chiapas	Berriozábal	7012	99.5	21.3	634.5	2,010.0	231.4	197.6	107.7
Chiapas	Bochil	7013	86.3	14.3	571.3	1,949.3	271.1	206.9	970.7
Chiapas	El Bosque	7014	53.0	4.6	351.7	1,222.1	194.6	136.1	416.0
Chiapas	Cacahoatán	7015	140.4	20.7	969.3	3,262.5	355.5	329.5	320.6
Chiapas	Catazajá	7016	55.8	6.9	347.0	1,090.3	187.6	119.8	1,210.4
Chiapas	Cintalapa	7017	404.1	45.5	2,451.6	10,056.2	1,295.9	1,051.2	3,623.0
Chiapas	Coapilla	7018	27.0	3.6	201.0	731.2	105.3	80.2	181.7
Chiapas	Comitán de Domínguez	7019	357.9	148.2	2,224.1	6,325.6	724.0	573.2	2,729.4
Chiapas	La Concordia	7020	749.0	16.9	4,371.2	22,606.7	2,950.2	2,418.3	4,865.0
Chiapas	Copainalá	7021	70.3	11.0	493.4	1,656.3	199.3	172.3	362.6
Chiapas	Chalchihuitán	7022	46.1	3.8	347.4	1,296.1	188.6	143.9	108.8
Chiapas	Chamula	7023	222.1	18.9	1,681.1	6,211.7	725.8	649.7	219.0
Chiapas	Chanal	7024	27.7	3.0	201.8	738.5	99.6	79.0	193.7
Chiapas	Chapultenango	7025	27.6	2.7	218.2	819.2	108.5	91.7	450.4
Chiapas	Chenalhó	7026	98.3	8.6	677.5	2,531.5	311.8	261.7	133.6
Chiapas	Chiapa de Corzo	7027	306.8	409.1	1,379.7	4,469.9	788.1	549.4	1,136.4

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Chiapas	Chiapilla	7028	21.1	2.5	146.3	476.7	81.2	55.6	67.8
Chiapas	Chicoasén	7029	15.2	2.6	96.9	324.3	47.9	34.6	154.2
Chiapas	Chicomuselo	7030	122.0	11.8	798.6	2,917.1	436.8	328.7	2,672.4
Chiapas	Chilón	7031	289.7	25.4	2,100.6	7,655.1	1,041.3	841.4	3,331.1
Chiapas	Escuintla	7032	101.5	16.6	718.6	2,379.4	305.4	251.1	409.8
Chiapas	Francisco León	7033	21.8	1.7	185.4	710.2	97.4	81.6	449.1
Chiapas	Frontera Comalapa	7034	267.4	35.1	1,357.1	4,490.1	690.6	506.0	227.1
Chiapas	Frontera Hidalgo	7035	48.7	5.3	222.1	697.3	91.8	70.1	107.6
Chiapas	La Grandeza	7036	22.3	2.3	164.5	625.9	82.0	67.4	35.4
Chiapas	Huehuetán	7037	154.2	14.5	811.3	2,840.7	328.1	291.7	374.6
Chiapas	Huixtán	7038	70.2	5.3	504.3	1,940.9	240.7	204.5	172.8
Chiapas	Huitiupán	7039	81.5	7.3	681.1	2,538.6	387.1	298.7	884.3
Chiapas	Huixtla	7040	826.6	1,097.6	1,657.2	3,716.7	2,115.5	1,207.5	495.4
Chiapas	La Independencia	7041	146.5	13.6	964.5	3,549.2	562.2	408.6	147.0
Chiapas	Ixhuatán	7042	34.1	4.2	255.6	940.7	117.6	102.5	235.2
Chiapas	Ixtacomitán	7043	34.7	4.4	251.4	926.2	108.2	98.4	319.8
Chiapas	Ixtapa	7044	76.3	6.8	544.8	1,959.3	282.1	216.3	314.3
Chiapas	Ixtapangajoya	7045	19.7	1.8	165.2	638.9	79.3	71.8	209.8
Chiapas	Jiquipilas	7046	258.8	15.3	1,129.2	4,303.5	709.0	488.2	1,546.1
Chiapas	Jitotol	7047	64.4	6.3	446.8	1,844.1	234.7	194.8	558.6
Chiapas	Juárez	7048	135.4	11.7	487.5	1,633.3	214.9	171.5	1,695.3
Chiapas	Larráinzar	7049	58.3	5.2	387.9	1,425.3	184.3	146.9	100.2
Chiapas	La Libertad	7050	22.0	2.5	154.1	532.3	90.8	62.5	695.2
Chiapas	Mapastepec	7051	215.3	24.9	957.9	3,136.0	363.6	319.1	1,353.6
Chiapas	Las Margaritas	7052	343.3	36.8	2,589.2	9,294.7	1,245.1	1,012.7	882.7
Chiapas	Mazapa de Madero	7053	34.0	2.5	235.2	963.5	118.1	102.9	58.2
Chiapas	Mazatlán	7054	167.0	12.4	568.8	1,901.8	227.7	195.6	437.0
Chiapas	Metapa	7055	20.8	2.5	120.8	422.7	64.3	47.4	12.7
Chiapas	Mitontic	7056	28.5	2.3	209.2	799.3	98.0	84.6	28.6
Chiapas	Motozintla	7057	221.2	26.9	1,560.0	5,435.2	685.4	576.0	358.3
Chiapas	Nicolás Ruiz	7058	53.8	1.0	337.7	1,747.6	237.0	190.5	38.2
Chiapas	Ocosingo	7059	553.3	79.1	4,054.3	13,094.1	2,230.7	1,517.7	3,933.1
Chiapas	Ocotepec	7060	34.9	3.6	258.2	978.9	119.2	103.5	86.2
Chiapas	Ocozocoautla de Espinosa	7061	308.7	93.5	1,950.8	6,742.9	1,075.8	770.9	2,230.3
Chiapas	Ostuacán	7062	69.2	8.2	594.0	2,003.8	281.6	227.5	1,594.6
Chiapas	Osumacinta	7063	11.3	1.7	78.9	261.5	53.5	31.9	104.8
Chiapas	Oxchuc	7064	141.0	14.0	1,024.5	3,897.4	478.7	411.1	238.1
Chiapas	Palenque	7065	506.8	62.8	2,450.9	8,234.9	1,231.2	928.9	5,612.6

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Chiapas	Pantelhó	7066	59.3	6.7	406.2	1,464.3	179.7	154.6	128.4
Chiapas	Pantepec	7067	31.9	3.0	232.3	878.8	105.4	91.9	273.7
Chiapas	Pichucalco	7068	192.7	21.6	743.0	2,504.1	283.6	256.0	1,406.9
Chiapas	Pijijiapan	7069	465.8	32.7	1,218.1	3,931.8	492.7	416.4	4,178.0
Chiapas	El Porvenir	7070	43.6	4.5	321.8	1,238.4	152.0	131.4	66.7
Chiapas	Villa Comaltitlán	7071	149.9	13.2	704.7	2,470.8	291.2	255.3	548.3
Chiapas	Pueblo Nuevo Solistahuacán	7072	90.6	11.3	659.8	2,459.0	324.4	262.8	580.1
Chiapas	Rayón	7073	24.5	3.8	159.6	560.6	67.8	57.8	140.8
Chiapas	Reforma	7074	1,247.6	88,369.6	823.1	2,207.8	211.9	178.0	1,064.0
Chiapas	Las Rosas	7075	78.9	15.5	583.4	1,997.3	257.7	209.5	138.2
Chiapas	Sabanilla	7076	86.4	7.5	715.3	2,696.1	390.2	313.2	495.1
Chiapas	Salto de Agua	7077	253.9	22.6	1,757.1	6,543.5	955.6	764.4	2,292.0
Chiapas	San Cristóbal de las Casas	7078	711.4	205.3	2,535.2	8,925.5	465.1	400.8	345.4
Chiapas	San Fernando	7079	126.8	12.5	844.7	3,312.0	406.0	345.2	476.0
Chiapas	Siltepec	7080	133.8	11.2	975.7	3,816.4	492.3	407.8	425.7
Chiapas	Simojovel	7081	111.8	14.9	786.6	2,529.5	435.4	288.0	828.5
Chiapas	Sitalá	7082	26.8	2.2	158.3	532.9	72.8	54.1	216.2
Chiapas	Socoltenango	7083	75.2	8.5	511.3	2,186.2	320.6	233.6	121.2
Chiapas	Solosuchiapa	7084	31.2	3.4	249.5	936.9	116.7	103.7	357.1
Chiapas	Soyaló	7085	39.3	3.3	263.8	1,082.9	147.7	117.5	106.0
Chiapas	Suchiapa	7086	90.5	10.8	581.4	2,298.5	310.2	244.7	375.2
Chiapas	Suchiate	7087	165.4	28.8	640.8	2,040.9	209.4	188.9	297.3
Chiapas	Sunuapa	7088	7.8	0.9	63.9	236.2	33.9	27.1	223.0
Chiapas	Tapachula	7089	1,595.7	404.1	6,147.5	19,110.1	1,387.2	1,281.1	1,264.7
Chiapas	Tapalapa	7090	13.7	1.2	101.5	378.9	48.5	40.4	148.6
Chiapas	Tapilula	7091	35.9	7.6	223.7	729.1	80.2	70.9	117.1
Chiapas	Tecpatán	7092	151.0	22.6	1,170.7	4,255.4	553.0	471.0	1,755.1
Chiapas	Tenejapa	7093	121.7	10.2	870.1	3,308.9	405.0	346.7	130.3
Chiapas	Teopisca	7094	99.8	21.0	727.1	2,513.0	309.6	260.2	170.0
Chiapas	Tila	7096	237.4	22.9	1,920.3	7,406.8	856.6	812.5	1,564.9
Chiapas	Tonalá	7097	447.2	68.5	1,664.6	4,895.9	636.8	482.9	3,679.3
Chiapas	Totolapa	7098	21.7	2.5	155.2	551.3	84.9	63.1	188.7
Chiapas	La Trinitaria	7099	296.7	23.5	1,822.8	6,737.2	785.7	714.9	430.5
Chiapas	Tumbalá	7100	105.6	9.6	877.4	3,242.0	655.3	407.8	895.2
Chiapas	Tuxtla Gutiérrez	7101	2,963.2	784.3	8,808.3	26,695.0	909.0	650.5	831.3
Chiapas	Tuxtla Chico	7102	137.5	15.6	1,017.4	3,676.8	444.1	400.3	218.1
Chiapas	Tuzantán	7103	109.4	20.2	704.5	2,492.2	317.0	273.9	281.0
Chiapas	Tzimol	7104	52.9	15.0	372.1	1,193.8	140.3	126.3	93.0

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Chiapas	Unión Juárez	7105	270.1	476.1	731.2	2,323.0	1,145.3	560.8	15.8
Chiapas	Venustiano Carranza	7106	218.5	45.5	1,417.9	4,777.1	518.5	481.7	1,481.6
Chiapas	Villa Corzo	7107	866.7	610.5	2,942.3	10,538.1	2,649.9	1,748.2	5,123.9
Chiapas	Villaflores	7108	496.1	68.2	2,893.4	11,318.9	1,775.8	1,240.5	3,751.7
Chiapas	Yajalón	7109	93.6	22.2	655.5	1,935.8	631.9	283.5	359.7
Chiapas	San Lucas	7110	22.1	2.7	175.6	578.2	91.6	66.9	139.9
Chiapas	Zinacantán	7111	123.1	11.9	871.4	3,389.9	402.3	358.7	129.8
Chiapas	San Juan Cancuc	7112	76.2	6.5	546.7	2,043.3	289.6	222.1	373.7
Chiapas	Aldama	7113	10.1	0.5	41.2	90.1	50.7	12.6	4.1
Chiapas	Benemérito de las Américas	7114	40.3	1.9	123.1	318.4	8.0	7.3	16.4
Chiapas	Maravilla Tenejapa	7115	31.1	1.5	94.8	245.9	6.2	5.6	12.6
Chiapas	Marqués de Comillas	7116	24.0	1.2	73.2	189.2	4.8	4.3	9.7
Chiapas	Montecristo de Guerrero	7117	17.6	0.7	63.9	233.5	17.0	15.2	5.8
Chiapas	San Andrés Duraznal	7118	9.5	0.5	29.4	84.9	1.9	1.7	3.9
Chiapas	Santiago el Pinal	7119	6.0	0.3	122.0	53.9	1.2	1.1	2.5
Chiapas Total			22,410.6	94,125.6	108,029.6	380,490.4	50,804.2	39,203.7	93,976.2
Chihuahua	Ahumada	8001	538.8	55.8	249.9	441.9	105.6	50.5	987.0
Chihuahua	Aldama	8002	598.0	27.6	335.9	649.6	91.5	54.8	885.2
Chihuahua	Allende	8003	193.3	8.8	156.0	341.9	67.8	31.3	221.7
Chihuahua	Aquiles Serdán	8004	42.5	1.5	60.2	173.2	9.6	6.9	38.0
Chihuahua	Ascensión	8005	693.6	97.5	482.2	1,221.1	247.5	136.8	1,105.2
Chihuahua	Bachíniva	8006	428.5	7.7	205.0	551.9	205.0	107.5	533.1
Chihuahua	Balleza	8007	117.3	11.4	473.2	1,591.4	227.9	166.0	887.5
Chihuahua	Batopilas	8008	92.6	11.3	387.6	1,370.1	182.9	149.7	299.5
Chihuahua	Bocoyna	8009	370.7	67.7	917.4	2,986.4	376.4	304.0	359.4
Chihuahua	Buenaventura	8010	527.5	134.4	471.1	1,044.1	219.3	126.0	1,004.4
Chihuahua	Camargo	8011	666.7	265.7	833.7	1,601.1	819.9	769.7	2,452.1
Chihuahua	Carichí	8012	231.4	6.0	264.0	908.6	189.6	121.4	545.7
Chihuahua	Casas Grandes	8013	359.2	8.9	372.6	1,458.6	206.2	158.7	797.9
Chihuahua	Coronado	8014	42.0	2.3	43.7	114.7	21.7	12.4	240.5
Chihuahua	Coyame del Sotol	8015	16.2	1.0	36.2	70.6	9.8	6.1	639.7
Chihuahua	La Cruz	8016	95.8	2.3	60.1	161.2	18.3	12.4	178.3
Chihuahua	Cuauhtémoc	8017	1,729.8	539.3	2,587.5	4,683.3	1,078.3	456.9	2,836.7
Chihuahua	Cusihuiriachi	8018	394.7	5.7	202.5	496.3	294.9	121.7	1,131.5
Chihuahua	Chihuahua	8019	13,048.5	10,224.0	18,805.0	59,916.5	3,431.1	2,406.0	3,136.6
Chihuahua	Chínipas	8020	57.4	2.7	252.3	1,007.7	129.4	108.6	236.0
Chihuahua	Delicias	8021	4,955.5	39,324.0	2,887.9	5,098.4	2,710.3	2,529.2	1,193.5
Chihuahua	Dr. Belisario Domínguez	8022	90.6	2.1	77.5	199.1	59.5	27.4	256.0

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Chihuahua	Galeana	8023	45.7	7.7	66.8	177.4	23.2	14.1	224.4
Chihuahua	Santa Isabel	8024	331.7	7.9	130.5	364.3	136.4	72.7	138.9
Chihuahua	Gómez Farías	8025	394.1	55.2	291.0	714.8	235.5	121.5	341.9
Chihuahua	Gran Morelos	8026	199.7	8.3	101.2	267.8	88.5	47.1	152.1
Chihuahua	Guachochi	8027	314.6	40.1	1,321.2	4,490.2	655.4	496.1	566.7
Chihuahua	Guadalupe	8028	207.7	22.3	173.9	428.9	55.5	42.9	674.4
Chihuahua	Guadalupe y Calvo	8029	408.9	37.5	1,784.0	7,073.2	871.4	737.0	386.4
Chihuahua	Guazapares	8030	176.0	5.8	351.0	1,485.2	188.7	156.6	230.5
Chihuahua	Guerrero	8031	1,173.1	72.8	1,005.6	2,774.8	590.6	345.9	1,221.8
Chihuahua	Hidalgo del Parral	8032	792.9	447.2	2,599.5	3,267.9	237.9	150.7	388.3
Chihuahua	Huejotitán	8033	8.3	0.4	23.4	64.5	19.2	7.8	143.2
Chihuahua	Ignacio Zaragoza	8034	426.2	67.2	296.2	769.4	211.3	126.3	359.3
Chihuahua	Janos	8035	208.3	6.0	211.4	515.5	192.3	80.6	1,293.0
Chihuahua	Jiménez	8036	349.4	96.7	637.7	1,101.6	142.1	75.9	1,102.5
Chihuahua	Juárez	8037	27,226.5	38,315.1	43,349.8	91,826.4	4,378.8	3,631.3	1,737.7
Chihuahua	Julimes	8038	82.1	2.7	86.3	183.7	32.4	18.2	656.0
Chihuahua	López	8039	115.3	4.7	75.2	186.7	31.9	19.0	225.3
Chihuahua	Madera	8040	622.5	95.7	976.3	2,832.4	531.4	323.6	660.3
Chihuahua	Maguarichi	8041	12.7	0.6	57.7	198.0	36.9	23.1	109.2
Chihuahua	Manuel Benavides	8042	35.3	0.7	38.5	101.5	13.4	11.0	399.2
Chihuahua	Matachí	8043	238.8	4.8	113.8	322.2	87.9	52.9	153.2
Chihuahua	Matamoros	8044	110.6	7.5	99.0	200.5	80.6	29.4	181.5
Chihuahua	Meoqui	8045	444.0	167.6	677.4	1,209.0	157.4	87.8	516.9
Chihuahua	Morelos	8046	66.2	3.1	279.2	1,004.5	122.0	107.3	225.2
Chihuahua	Moris	8047	43.6	22.3	162.5	572.9	576.1	201.9	248.7
Chihuahua	Namiquipa	8048	2,036.2	41.5	836.4	2,192.9	1,028.8	499.8	1,735.8
Chihuahua	Noñoava	8049	19.7	1.6	75.1	232.9	45.1	25.8	340.1
Chihuahua	Nuevo Casas Grandes	8050	559.3	375.2	1,055.1	1,830.5	141.0	90.8	1,338.8
Chihuahua	Ocampo	8051	73.1	7.2	331.1	1,413.1	173.6	147.0	264.1
Chihuahua	Ojinaga	8052	486.2	86.1	554.1	889.8	99.5	67.5	458.9
Chihuahua	Praxedis G. Guerrero	8053	206.8	49.7	200.4	395.7	51.0	41.3	229.3
Chihuahua	Riva Palacio	8054	216.4	4.3	228.8	514.3	337.4	107.6	1,472.1
Chihuahua	Rosales	8055	498.6	18.6	269.4	647.4	116.0	80.9	379.1
Chihuahua	Rosario	8056	24.2	1.5	52.6	156.8	32.3	16.8	256.0
Chihuahua	San Francisco de Borja	8057	38.8	6.4	57.4	132.8	37.6	17.2	222.5
Chihuahua	San Francisco de Conchos	8058	27.4	1.4	51.1	89.5	16.4	7.5	139.3
Chihuahua	San Francisco del Oro	8059	54.3	31.6	100.9	221.4	20.6	12.8	50.7
Chihuahua	Santa Bárbara	8060	221.8	215.2	270.3	471.3	85.1	47.4	70.5

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State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
Chihuahua	Satevó	8061	99.9	2.9	121.1	292.3	104.7	46.4	515.8
Chihuahua	Saucillo	8062	290.8	128.7	489.7	884.1	98.7	53.2	831.4
Chihuahua	Temósachi	8063	180.3	4.8	253.4	867.9	159.7	103.5	310.6
Chihuahua	El Tule	8064	20.6	1.2	39.1	105.7	27.3	11.6	117.0
Chihuahua	Urique	8065	258.8	7.9	577.0	2,129.3	284.8	232.7	324.1
Chihuahua	Uruachi	8066	62.3	3.1	264.7	953.1	125.3	104.2	285.1
Chihuahua	Valle de Zaragoza	8067	80.9	4.4	122.5	259.2	66.0	32.5	331.8
Chihuahua Total			64,781.6	91,301.0	91,021.3	222,901.1	23,449.9	16,591.5	41,975.3
Distrito Federal	Azcapotzalco	9002	5,346.2	532.3	18,760.4	40,330.2	605.7	514.5	480.1
Distrito Federal	Coyoacán	9003	6,491.2	324.1	13,273.2	57,945.6	436.7	393.4	683.8
Distrito Federal	Cuajimalpa de Morelos	9004	1,423.5	73.3	2,729.7	12,535.6	115.6	99.7	192.6
Distrito Federal	Gustavo A. Madero	9005	12,557.1	748.6	26,647.0	111,854.8	1,021.8	903.2	1,154.0
Distrito Federal	Iztacalco	9006	4,343.8	246.4	14,980.5	37,261.4	364.1	330.6	439.9
Distrito Federal	Iztapalapa	9007	18,013.5	1,311.7	41,420.2	160,541.2	1,294.4	1,165.3	1,672.7
Distrito Federal	La Magdalena Contreras	9008	2,227.0	94.3	3,983.1	20,115.7	162.6	144.2	250.8
Distrito Federal	Milpa Alta	9009	634.1	20.8	1,246.6	3,816.4	96.5	88.6	325.2
Distrito Federal	Alvaro Obregón	9010	6,955.8	352.6	16,446.9	62,189.7	558.1	488.4	744.1
Distrito Federal	Tláhuac	9011	2,900.9	142.5	5,837.3	24,535.9	235.6	214.1	566.8
Distrito Federal	Tlalpan	9012	5,785.2	804.7	11,147.9	49,827.8	515.0	424.8	796.0
Distrito Federal	Xochimilco	9013	3,694.9	203.1	7,363.0	33,312.1	319.1	268.6	669.7
Distrito Federal	Benito Juárez	9014	4,699.5	292.4	9,731.5	34,203.3	253.6	226.8	384.9
Distrito Federal	Cuauhtémoc	9015	5,596.9	340.4	15,627.5	46,843.4	434.1	349.2	551.2
Distrito Federal	Miguel Hidalgo	9016	4,121.1	264.0	12,853.3	32,623.2	333.3	279.0	376.5
Distrito Federal	Venustiano Carranza	9017	4,758.0	637.8	11,035.8	41,894.1	367.6	312.0	494.1
Distrito Federal Total			89,548.8	6,388.9	213,084.0	769,830.4	7,113.9	6,202.3	9,782.5
Durango	Canatlán	10001	582.7	28.6	640.4	1,623.9	447.7	205.7	1,380.7
Durango	Canelas	10002	23.6	3.7	131.4	441.6	89.8	55.7	526.7
Durango	Coneto de Comonfort	10003	34.1	1.6	94.6	305.0	54.4	32.0	553.1
Durango	Cuencamé	10004	691.0	42.3	623.2	1,389.8	638.7	231.0	1,478.7
Durango	Durango	10005	5,237.6	6,030.9	25,505.3	37,971.5	2,365.1	1,605.8	3,731.5
Durango	General Simón Bolívar	10006	213.4	6.1	189.2	570.6	57.4	55.0	503.7
Durango	Gómez Palacio	10007	6,270.5	20,522.7	8,797.7	14,481.3	1,715.0	1,206.4	5,577.2
Durango	Guadalupe Victoria	10008	771.8	45.8	626.0	1,364.5	665.2	244.3	906.2
Durango	Guanaceví	10009	64.2	10.8	289.9	1,003.8	132.8	102.5	1,015.3
Durango	Hidalgo	10010	115.3	2.4	114.5	280.9	142.0	53.1	1,086.0
Durango	Indé	10011	87.4	3.7	135.4	337.8	168.8	59.2	1,396.0
Durango	Lerdo	10012	969.6	211.2	2,339.1	4,899.7	139.4	125.2	3,014.9
Durango	Mapimí	10013	494.2	32.2	364.0	786.3	77.9	69.7	1,893.3

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Durango	Mezquital	10014	195.7	8.8	1,143.3	4,923.2	616.0	512.5	1,601.8
Durango	Nazas	10015	92.0	6.5	171.9	422.9	30.2	28.5	547.5
Durango	Nombre de Dios	10016	226.3	23.9	368.0	794.1	197.9	89.2	586.7
Durango	Ocampo	10017	169.9	7.2	212.7	529.5	127.9	61.9	1,856.1
Durango	El Oro	10018	78.7	8.2	226.7	571.3	114.9	54.2	1,508.5
Durango	Otáez	10019	321.3	21.7	172.9	628.1	100.5	80.9	451.1
Durango	Pánuco de Coronado	10020	291.5	14.5	264.3	554.3	255.8	93.4	464.1
Durango	Peñón Blanco	10021	240.5	10.4	213.1	471.6	209.2	75.2	529.2
Durango	Poanas	10022	359.9	16.8	406.9	1,080.1	315.1	135.0	787.3
Durango	Pueblo Nuevo	10023	310.8	73.9	1,590.5	5,837.6	671.4	594.2	1,066.2
Durango	Rodeo	10024	76.6	8.6	185.7	535.5	35.7	33.7	670.3
Durango	San Bernardo	10025	36.2	1.5	95.8	269.4	84.4	36.1	1,016.6
Durango	San Dimas	10026	169.6	22.6	820.1	3,411.4	455.3	369.5	906.9
Durango	San Juan de Guadalupe	10027	143.3	3.6	136.4	437.4	40.4	38.4	401.1
Durango	San Juan del Río	10028	137.4	7.8	228.8	609.0	171.3	74.2	979.6
Durango	San Luis de Cordero	10029	19.2	1.3	30.1	86.9	6.3	5.9	144.1
Durango	San Pedro del Gallo	10030	29.1	0.8	41.3	102.3	9.8	9.3	676.4
Durango	Santa Clara	10031	174.2	4.8	143.7	316.0	186.3	65.1	439.5
Durango	Santiago Papasquiaro	10032	624.1	66.3	947.0	2,574.0	446.6	266.5	1,861.1
Durango	Súchil	10033	48.4	5.6	154.4	394.1	87.3	42.2	311.7
Durango	Tamazula	10034	158.2	10.8	916.5	3,616.2	495.4	397.7	1,637.2
Durango	Tepehuanes	10035	242.4	13.6	596.2	2,563.1	355.1	272.8	1,251.9
Durango	Tlahualilo	10036	171.4	10.0	253.1	589.8	38.9	36.6	1,154.6
Durango	Topia	10037	110.7	5.8	633.2	3,145.5	383.1	326.9	483.3
Durango	Vicente Guerrero	10038	158.3	22.9	372.3	671.7	168.6	63.0	220.6
Durango	Nuevo Ideal	10039	655.5	22.1	495.4	1,320.2	366.8	185.7	1,350.2
Durango Total			20,796.4	27,341.9	50,670.9	101,911.8	12,664.1	7,994.4	45,967.0
Guanajuato	Abasolo	11001	516.1	97.3	1,554.8	4,747.5	639.9	437.4	1,268.4
Guanajuato	Acámbaro	11002	934.4	174.8	1,882.9	4,808.4	538.0	378.0	1,196.3
Guanajuato	Allende	11003	705.7	366.6	2,396.0	5,750.5	596.4	414.1	2,726.5
Guanajuato	Apaseo el Alto	11004	259.2	130.7	1,034.2	2,491.8	339.8	199.6	1,605.8
Guanajuato	Apaseo el Grande	11005	595.7	1,309.4	1,230.9	2,485.4	347.6	206.9	3,307.5
Guanajuato	Atarjea	11006	20.9	1.6	132.2	460.2	60.9	48.7	81.3
Guanajuato	Celaya	11007	3,107.9	2,180.3	13,494.6	22,853.5	787.4	573.5	2,640.1
Guanajuato	Manuel Doblado	11008	272.1	68.7	746.2	2,168.2	409.6	225.2	1,151.1
Guanajuato	Comonfort	11009	328.7	91.5	1,260.9	3,435.7	395.6	281.0	1,070.4
Guanajuato	Coroneo	11010	41.7	22.0	218.9	630.9	92.2	59.9	287.1
Guanajuato	Cortazar	11011	416.9	247.0	1,319.9	3,083.8	299.8	205.4	1,088.4

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State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
Guanajuato	Cuerámaro	11012	215.0	30.6	467.2	1,457.8	187.7	132.9	338.1
Guanajuato	Doctor Mora	11013	83.5	21.5	348.1	1,020.3	169.9	94.6	628.6
Guanajuato	Dolores Hidalgo	11014	721.5	446.6	2,213.8	5,337.1	622.0	416.7	1,387.5
Guanajuato	Guanajuato	11015	550.2	446.1	1,991.8	4,676.8	289.6	228.0	549.9
Guanajuato	Huanímaro	11016	190.7	26.2	367.7	1,173.7	182.7	116.3	528.0
Guanajuato	Irapuato	11017	3,661.6	2,593.6	10,778.1	27,985.9	1,200.8	883.6	2,343.8
Guanajuato	Jaral del Progreso	11018	230.8	52.6	528.4	1,400.1	198.5	119.0	413.9
Guanajuato	Jerécuaro	11019	266.3	36.4	1,165.7	3,591.0	608.1	369.3	821.3
Guanajuato	León	11020	10,734.1	9,671.1	28,021.3	85,779.8	1,815.6	1,379.6	4,166.5
Guanajuato	Moroleón	11021	265.1	500.7	927.8	1,485.3	106.5	79.4	329.8
Guanajuato	Ocampo	11022	136.3	20.4	396.3	1,171.7	331.0	142.5	395.8
Guanajuato	Pénjamo	11023	1,419.9	254.8	2,840.7	8,417.8	1,138.3	802.5	2,761.9
Guanajuato	Pueblo Nuevo	11024	50.3	10.1	164.2	429.3	70.7	34.0	621.7
Guanajuato	Purísima del Rincón	11025	270.8	332.9	748.4	1,442.0	169.9	88.9	1,008.8
Guanajuato	Romita	11026	346.1	46.4	880.6	2,592.0	397.8	238.4	849.4
Guanajuato	Salamanca	11027	16,303.1	111,098.8	8,093.0	14,345.5	5,866.9	4,402.6	2,003.9
Guanajuato	Salvatierra	11028	728.2	128.1	1,608.0	4,363.6	560.4	366.0	1,005.5
Guanajuato	San Diego de la Unión	11029	244.3	19.7	624.6	1,909.3	287.3	179.8	1,141.6
Guanajuato	San Felipe	11030	659.7	78.0	1,709.5	5,301.8	887.3	510.5	1,123.4
Guanajuato	San Francisco del Rincón	11031	1,045.4	1,341.4	2,470.3	6,825.1	368.5	236.1	909.8
Guanajuato	San José Iturbide	11032	347.7	418.3	1,093.2	2,213.2	306.9	179.2	682.6
Guanajuato	San Luis de la Paz	11033	510.6	114.7	1,537.7	4,309.1	421.0	311.1	2,553.4
Guanajuato	Santa Catarina	11034	17.4	3.4	100.6	321.2	35.9	29.6	84.4
Guanajuato	Santa Cruz de Juventino Rosas	11035	366.4	154.6	1,092.5	2,905.3	321.3	224.9	1,939.0
Guanajuato	Santiago Maravatío	11036	98.8	6.2	149.9	455.3	70.9	48.8	126.6
Guanajuato	Silao	11037	821.0	568.7	3,187.5	5,333.5	498.0	349.8	1,516.8
Guanajuato	Tarandacuaó	11038	104.6	21.1	195.5	500.3	76.8	43.4	260.5
Guanajuato	Tarimoro	11039	252.7	44.3	624.0	1,662.3	213.6	134.6	458.9
Guanajuato	Tierra Blanca	11040	56.8	7.8	341.7	1,230.4	132.5	118.5	175.8
Guanajuato	Uriangato	11041	217.5	217.5	830.5	1,730.7	105.6	85.1	364.2
Guanajuato	Valle de Santiago	11042	945.6	157.8	2,366.0	7,016.1	922.9	635.0	1,618.4
Guanajuato	Victoria	11043	69.0	7.8	389.0	1,282.3	159.8	122.6	595.1
Guanajuato	Villagrán	11044	444.7	364.0	864.9	1,688.7	229.1	135.3	1,570.5
Guanajuato	Xichú	11045	45.9	4.4	307.5	1,049.3	146.5	113.9	159.1
Guanajuato	Yuriria	11046	480.5	118.2	1,486.4	4,463.9	525.0	401.9	765.9
Guanajuato Total			50,101.5	134,054.7	106,183.9	269,783.5	24,132.3	16,784.0	52,623.7
Guerrero	Acapulco de Juárez	12001	5,292.7	1,375.2	15,584.8	50,634.0	2,487.5	2,162.9	2,078.6
Guerrero	Ahuacutzingo	12002	76.4	7.5	563.6	2,155.0	275.1	232.7	693.0

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State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
Guerrero	Ajuchitlán del Progreso	12003	182.5	25.7	1,006.0	3,479.1	483.0	376.2	1,529.2
Guerrero	Alcozauca de Guerrero	12004	60.9	5.5	427.7	1,603.7	202.3	174.0	343.4
Guerrero	Alpoyeca	12005	27.8	3.8	129.3	454.1	53.7	46.0	88.6
Guerrero	Apaxtla	12006	50.9	9.0	315.2	1,070.5	148.2	114.4	498.2
Guerrero	Arcelia	12007	137.2	36.6	710.2	2,272.7	277.9	225.6	628.1
Guerrero	Atenango del Río	12008	37.0	5.5	226.2	767.6	106.7	83.9	486.8
Guerrero	Atlamajalcingo del Monte	12009	19.4	1.5	137.4	530.8	70.4	57.0	76.3
Guerrero	Atlixzac	12010	83.1	7.2	590.3	2,273.1	274.8	239.9	468.6
Guerrero	Atoyac de Alvarez	12011	254.1	52.3	1,456.0	4,597.3	596.2	472.5	1,185.9
Guerrero	Ayutla de los Libres	12012	227.1	28.0	1,594.1	5,880.9	696.3	625.1	873.6
Guerrero	Azoyú	12013	145.7	23.3	952.9	3,319.0	419.3	361.8	695.0
Guerrero	Benito Juárez	12014	68.5	15.5	252.4	718.1	73.3	59.9	198.5
Guerrero	Buenavista de Cuéllar	12015	205.5	81.6	298.0	603.5	62.0	51.5	244.9
II-H	Coahuayutla de José María Izazaga	12016	91.0	5.7	628.2	2,653.5	354.5	289.8	1,904.3
	Cocula	12017	150.3	11.2	348.7	1,196.0	157.8	125.8	362.6
	Copala	12018	61.8	11.2	338.4	1,192.8	153.2	128.2	251.6
	Copalillo	12019	125.5	63.0	466.4	1,479.1	195.9	166.4	626.1
	Copanatoyac	12020	60.9	5.6	424.5	1,587.7	199.8	172.2	256.8
	Coyuca de Benítez	12021	277.2	37.9	1,669.7	5,585.8	747.1	588.6	1,484.6
	Coyuca de Catalán	12022	212.8	24.3	1,045.4	3,452.0	515.0	367.2	2,715.9
	Cuajinicuilapa	12023	136.1	20.5	686.0	2,313.3	277.3	244.8	513.1
	Cualác	12024	26.0	3.0	183.8	694.6	92.5	75.2	188.9
	Cuautepec	12025	62.2	6.0	484.2	1,817.4	261.2	209.4	252.2
	Cuetzala del Progreso	12026	39.0	4.4	277.6	1,021.5	135.9	112.8	301.0
	Cutzamala de Pinzón	12027	114.9	12.2	524.7	1,674.9	244.9	173.2	1,062.3
	Chilapa de Alvarez	12028	443.0	95.7	2,651.2	9,360.5	1,084.4	950.6	801.1
	Chilpancingo de los Bravo	12029	1,257.8	293.6	4,324.3	16,410.7	1,322.0	1,126.7	1,897.3
	Florencio Villarreal	12030	84.6	14.1	497.2	1,757.4	224.7	189.0	211.8
	General Canuto A. Neri	12031	31.3	3.8	229.6	852.6	121.7	97.0	212.1
	General Heliodoro Castillo	12032	139.4	15.2	1,005.5	3,814.0	523.4	417.3	1,301.9
	Huamuxtitlán	12033	64.4	9.9	322.7	1,065.3	132.9	109.2	232.0
	Huitzoco de los Figueroa	12034	160.1	42.5	741.2	2,242.1	302.9	223.7	1,059.4
	Iguala de la Independencia	12035	855.4	241.2	2,223.3	6,400.2	276.9	229.6	581.8
	Igualapa	12036	47.1	8.2	321.4	1,205.4	172.5	137.6	147.6
	Ixcateopan de Cuauhtémoc	12037	33.2	8.3	198.5	664.7	83.1	69.2	172.3
	José Azueta	12038	405.1	182.8	1,773.1	4,034.1	467.0	323.1	1,207.3
	Juan R. Escudero	12039	90.8	19.3	557.4	1,996.8	258.0	211.7	335.8

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Guerrero	Leonardo Bravo	12040	198.3	96.4	1,018.6	2,132.0	281.8	231.8	570.9
Guerrero	Malinaltepec	12041	143.1	10.5	1,018.4	4,048.5	480.9	425.0	635.3
Guerrero	Mártir de Cuilapan	12042	58.9	6.9	405.6	1,526.1	196.8	167.1	493.5
Guerrero	Metlatónoc	12043	114.5	9.1	832.8	3,206.8	384.5	338.3	937.2
Guerrero	Mochitlán	12044	46.8	5.8	292.0	1,125.3	150.0	120.9	406.4
Guerrero	Olinalá	12045	99.3	20.2	604.9	2,186.6	273.3	234.2	569.8
Guerrero	Ometepec	12046	232.1	56.7	1,421.6	4,861.6	622.6	526.5	524.6
Guerrero	Pedro Ascencio Alquisiras	12047	31.5	3.0	235.6	910.4	125.2	100.4	248.5
Guerrero	Petatlán	12048	221.9	50.3	1,008.3	3,182.8	409.8	319.7	1,576.5
Guerrero	Pilcaya	12049	51.3	13.3	210.9	695.4	85.8	65.3	130.0
Guerrero	Pungarabato	12050	154.9	71.5	491.7	1,200.5	119.3	83.2	139.2
Guerrero	Quechultenango	12051	139.0	16.7	982.1	3,643.0	484.8	403.6	671.4
Guerrero	San Luis Acatlán	12052	177.8	15.5	1,278.2	5,007.0	703.7	557.0	868.1
Guerrero	San Marcos	12053	218.2	36.2	1,431.0	5,005.9	712.6	563.6	979.4
Guerrero	San Miguel Totolapan	12054	126.4	14.5	890.4	3,215.7	463.8	362.4	1,921.1
Guerrero	Taxco de Alarcón	12055	609.8	301.0	2,330.4	5,053.4	485.8	406.8	618.7
Guerrero	Tecoanapa	12056	171.5	19.0	1,296.5	4,708.3	587.2	515.4	581.2
Guerrero	Técpán de Galeana	12057	363.6	100.0	1,615.9	5,348.7	653.3	533.3	2,186.9
Guerrero	Teloloapan	12058	218.3	46.7	1,295.7	4,538.7	537.9	454.6	833.6
Guerrero	Tepecoacuilco de Trujano	12059	142.7	32.6	690.4	2,195.8	272.5	221.4	690.0
Guerrero	Tetipac	12060	54.9	9.2	355.0	1,213.3	149.4	125.0	189.7
Guerrero	Tixtla de Guerrero	12061	159.2	47.5	757.3	2,373.2	259.5	228.7	333.7
Guerrero	Tlacoachistlahuaca	12062	71.0	13.2	458.3	1,645.5	245.9	187.4	663.7
Guerrero	Tlacoapa	12063	35.4	3.2	248.5	932.7	111.6	99.7	222.9
Guerrero	Tlalchapa	12064	57.6	9.8	283.3	888.1	140.5	95.7	324.3
Guerrero	Tlalixtaquilla de Maldonado	12065	26.8	3.6	182.3	672.0	90.5	74.1	95.3
Guerrero	Tlapa de Comonfort	12066	215.7	49.4	1,280.4	4,238.3	489.0	425.8	532.5
Guerrero	Tlapehuala	12067	110.6	25.3	485.6	1,535.8	185.4	152.6	246.2
Guerrero	La Unión de Isidoro Montes de Oca	12068	14,879.3	187,124.5	3,319.3	3,944.4	8,942.0	6,490.3	1,453.4
Guerrero	Xalpatláhuac	12069	45.5	4.3	328.7	1,277.9	148.5	134.4	189.2
Guerrero	Xochihuehuetlán	12070	33.8	7.1	189.0	646.8	77.2	66.7	224.5
Guerrero	Xochistlahuaca	12071	95.6	14.2	676.7	2,425.7	326.4	269.2	382.5
Guerrero	Zapotitlán Tablas	12072	39.3	3.8	276.0	1,059.5	121.3	109.9	184.2
Guerrero	Zirándaro	12073	101.2	11.2	568.3	1,912.8	281.7	208.6	1,697.5
Guerrero	Zitlala	12074	71.4	8.3	496.3	1,855.1	241.3	203.9	251.5
Guerrero	Eduardo Neri	12075	170.1	37.4	910.0	3,025.6	376.4	311.8	1,024.4
Guerrero	Acatepec	12076	95.6	7.8	683.4	2,633.4	310.7	275.9	514.3

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Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Guerrero Total			31,621.7	191,123.6	77,016.8	250,904.6	35,060.2	28,112.0	52,280.2
Hidalgo	Acatlán	13001	231.5	7.3	330.3	989.7	162.5	102.2	456.3
Hidalgo	Acaxochitlán	13002	280.2	35.6	980.7	3,397.5	415.3	350.2	257.9
Hidalgo	Actopan	13003	372.5	39.3	775.3	1,876.7	189.1	138.3	513.0
Hidalgo	Agua Blanca de Iturbide	13004	74.9	4.2	232.1	817.3	111.7	87.7	284.7
Hidalgo	Ajacuba	13005	320.3	11.6	308.2	697.4	114.8	76.6	230.0
Hidalgo	Alfajayucan	13006	185.5	7.6	439.2	1,247.1	204.9	137.1	371.8
Hidalgo	Almoloya	13007	414.7	7.7	233.7	704.2	156.7	105.6	249.5
Hidalgo	Apan	13008	1,093.9	36.2	745.1	1,904.2	340.8	235.4	441.5
Hidalgo	El Arenal	13009	107.1	6.0	213.8	614.0	74.2	48.2	198.3
Hidalgo	Atitalaquia	13010	269.3	28.2	543.9	777.3	91.1	57.9	263.3
Hidalgo	Atlapexco	13011	143.0	8.3	650.2	2,469.5	322.4	281.1	143.7
Hidalgo	Atotonilco el Grande	13012	212.6	15.9	467.7	1,411.6	181.1	129.1	434.3
Hidalgo	Atotonilco de Tula	13013	1,207.5	1,477.5	411.9	944.5	1,168.8	665.3	249.6
Hidalgo	Calnali	13014	121.3	7.3	493.0	1,768.0	257.6	199.7	135.2
Hidalgo	Cardonal	13015	164.9	5.9	374.0	1,291.6	173.1	133.6	311.8
Hidalgo	Cuauhtepetl de Hinojosa	13016	395.1	32.0	823.5	2,380.5	305.2	212.3	320.0
Hidalgo	Chapantongo	13017	114.9	4.3	249.5	763.4	119.6	79.0	258.7
Hidalgo	Chapulhuacán	13018	154.2	8.6	601.1	2,176.0	273.5	237.5	233.2
Hidalgo	Chilcuautla	13019	159.7	5.3	301.6	995.7	135.8	100.5	245.9
Hidalgo	Eloxochitlán	13020	22.1	1.0	82.4	279.0	39.9	29.8	87.5
Hidalgo	Emiliano Zapata	13021	351.5	9.4	232.5	521.2	72.7	58.7	164.8
Hidalgo	Epazoyucan	13022	201.5	5.4	210.6	599.6	113.2	70.0	310.9
Hidalgo	Francisco I. Madero	13023	294.0	14.3	423.7	1,137.2	128.1	89.2	333.3
Hidalgo	Huasca de Ocampo	13024	188.6	6.5	311.6	1,023.9	155.8	108.9	371.8
Hidalgo	Huautla	13025	240.0	10.7	825.4	3,095.6	435.8	362.4	269.8
Hidalgo	Huazalingo	13026	84.9	4.3	379.9	1,433.5	194.9	163.5	133.4
Hidalgo	Huehuetla	13027	191.8	10.1	863.1	3,250.0	423.7	366.7	311.9
Hidalgo	Huejutla de Reyes	13028	845.6	65.9	3,309.5	11,760.5	1,467.5	1,291.4	642.4
Hidalgo	Huichapan	13029	1,578.4	1,584.1	798.2	2,097.6	675.7	319.4	879.4
Hidalgo	Ixmiquilpan	13030	681.7	54.2	1,248.8	3,538.2	366.7	287.7	1,005.1
Hidalgo	Jacala de Ledezma	13031	104.3	6.6	287.7	943.1	121.5	97.2	154.3
Hidalgo	Jaltocán	13032	78.0	4.9	370.1	1,338.9	165.3	149.7	107.2
Hidalgo	Juárez Hidalgo	13033	23.5	2.3	90.0	320.2	42.8	34.2	59.7
Hidalgo	Lolotla	13034	198.5	2,941.7	291.1	2,074.9	223.8	137.3	125.3
Hidalgo	Metepec	13035	218.6	5.5	233.6	775.8	137.8	94.0	269.4
Hidalgo	San Agustín Metzquititlán	13036	65.1	3.6	192.5	623.9	81.1	63.5	159.7
Hidalgo	Metztitlán	13037	418.4	11.2	524.9	1,751.7	258.8	211.6	304.0

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State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
Hidalgo	Mineral del Chico	13038	48.8	2.4	150.7	518.1	71.6	52.2	179.5
	Mineral del Monte	13039	86.0	8.3	197.9	544.5	45.3	36.7	198.1
	La Misión	13040	80.3	3.7	300.9	1,110.1	136.5	116.2	159.4
	Mixquiahuala de Juárez	13041	412.0	29.0	520.6	1,368.9	163.0	110.9	375.9
	Molango de Escamilla	13042	76.7	5.6	268.8	926.1	112.8	92.6	138.7
	Nicolás Flores	13043	49.4	2.4	182.5	673.1	79.5	69.5	101.7
	Nopala de Villagrán	13044	257.1	6.8	302.3	946.8	161.4	102.6	366.1
	Omitlán de Juárez	13045	56.2	2.9	168.0	594.2	69.7	56.6	195.6
	San Felipe Orizatlán	13046	341.0	19.0	1,355.7	5,061.3	671.4	579.3	630.0
	Pacula	13047	43.5	2.1	141.5	488.1	60.3	51.5	88.1
	Pachuca de Soto	13048	2,691.1	437.5	6,024.0	16,394.5	390.9	313.0	583.8
	Pisaflores	13049	125.8	6.6	563.8	2,081.5	264.4	233.1	197.8
	Progreso de Obregón	13050	807.7	815.5	303.1	787.0	537.6	313.9	139.9
	Mineral de la Reforma	13051	573.5	57.2	861.7	2,533.3	110.6	83.3	317.3
	San Agustín Tlaxiaca	13052	353.8	11.3	380.9	1,073.4	133.8	95.7	304.9
	San Bartolo Tutotepec	13053	138.3	7.4	557.6	2,044.6	262.5	224.3	241.9
	San Salvador	13054	235.1	7.7	438.1	1,406.2	165.4	118.4	283.9
	Santiago de Anaya	13055	128.7	4.1	253.4	819.6	113.9	80.0	229.5
	Santiago Tulantepec de Lugo Guerrero	13056	241.6	10.8	449.2	1,091.3	101.0	75.1	262.2
	Singuilucan	13057	326.7	7.9	359.5	1,274.9	220.8	153.7	283.9
	Tasquillo	13058	117.1	7.1	322.8	1,031.2	137.2	97.4	304.2
	Tecoautla	13059	274.6	12.0	566.5	1,777.9	231.5	164.0	902.5
	Tenango de Doria	13060	122.1	6.4	431.9	1,539.6	185.9	156.5	189.8
	Tepeapulco	13061	857.2	45.2	1,765.5	1,820.8	207.2	159.5	336.6
	Tepehuacán de Guerrero	13062	197.5	10.0	887.4	3,371.6	430.4	377.6	270.6
	Tepeji del Río de Ocampo	13063	639.3	57.7	1,634.7	2,606.2	304.1	190.1	615.0
	Tepetitlán	13064	114.3	3.3	152.2	471.9	64.2	44.2	147.7
	Tetepango	13065	57.8	3.7	111.8	292.2	27.6	16.3	121.8
	Villa de Tezontepec	13066	89.4	4.8	148.4	302.2	38.5	19.9	268.7
	Tezontepec de Aldama	13067	997.9	28.6	736.3	2,294.2	326.3	269.6	402.8
	Tianguistengo	13068	99.3	5.4	390.8	1,463.1	181.0	152.8	131.5
	Tizayuca	13069	986.0	287.8	1,258.9	1,779.8	232.9	146.3	975.0
	Tlahuelilpan	13070	90.8	9.7	187.9	445.3	35.7	22.9	155.5
	Tlahuitlapa	13071	75.4	3.2	277.5	1,019.5	128.2	106.9	153.4
	Tlanalapa	13072	144.0	5.4	138.0	336.6	44.7	26.7	147.0
	Tlanchinol	13073	237.1	12.1	945.6	3,530.0	441.2	378.1	165.5
	Tlaxcoapan	13074	225.8	16.0	319.9	797.5	74.2	52.2	215.4

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Hidalgo	Tolcayuca	13075	161.4	5.6	240.0	468.7	64.4	37.9	326.5
Hidalgo	Tula de Allende	13076	35,831.1	349,470.4	4,763.5	8,574.3	16,801.0	12,111.0	602.9
Hidalgo	Tulancingo de Bravo	13077	1,119.4	625.4	1,948.4	3,998.2	370.4	259.4	613.8
Hidalgo	Xochiatipan	13078	139.8	7.1	645.1	2,477.2	337.7	288.0	76.4
Hidalgo	Xochicoatlán	13079	54.1	2.7	194.5	687.9	99.9	73.7	138.9
Hidalgo	Yahualica	13080	162.3	8.5	782.9	3,014.7	400.2	346.6	94.0
Hidalgo	Zacualtipán de Angeles	13081	173.1	13.7	533.3	1,278.7	113.1	99.4	129.5
Hidalgo	Zapotlán de Juárez	13082	426.5	12.4	273.7	652.8	111.3	81.0	254.8
Hidalgo	Zempoala	13083	762.7	15.2	463.2	1,299.4	249.7	170.0	534.6
Hidalgo	Zimapán	13084	284.1	21.9	678.7	2,089.0	261.1	192.6	216.9
Hidalgo Total			63,323.1	358,639.7	54,430.0	154,949.5	35,675.4	26,311.7	25,058.4
Jalisco	Acatic	14001	189.3	44.7	356.0	725.8	148.1	61.4	3,958.5
Jalisco	Acatlán de Juárez	14002	278.2	125.8	446.3	1,105.8	465.0	212.0	331.1
Jalisco	Ahuatlulco de Mercado	14003	202.8	24.1	380.9	1,264.3	188.9	110.8	422.6
Jalisco	Amacueca	14004	95.5	5.5	107.4	327.3	49.7	33.0	346.4
Jalisco	Amatitán	14005	177.9	15.7	214.5	548.2	67.5	49.7	259.9
Jalisco	Ameca	14006	732.8	596.8	1,205.1	3,103.5	1,043.6	501.7	2,121.6
Jalisco	San Juanito de Escobedo	14007	171.7	7.2	159.4	510.6	99.3	55.8	255.4
Jalisco	Arandas	14008	403.4	188.3	1,253.9	2,602.9	304.1	155.9	6,015.5
Jalisco	El Arenal	14009	336.6	26.1	270.6	818.2	113.1	81.9	342.1
Jalisco	Atemajac de Brizuela	14010	44.0	8.6	159.6	540.6	85.3	57.5	360.1
Jalisco	Atengo	14011	51.1	2.9	137.5	417.7	106.8	52.5	665.5
Jalisco	Atenguillo	14012	31.8	2.9	98.0	303.3	77.8	34.8	529.7
Jalisco	Atotonilco el Alto	14013	631.1	98.9	913.3	2,219.5	283.3	195.7	1,476.1
Jalisco	Atoyac	14014	72.1	13.1	229.3	801.3	129.0	83.1	454.9
Jalisco	Autlán de Navarro	14015	506.1	214.5	1,148.9	3,093.5	835.3	434.1	653.4
Jalisco	Ayotlán	14016	443.1	63.5	688.9	1,720.2	287.0	168.8	1,215.8
Jalisco	Ayutla	14017	147.7	13.6	316.1	1,001.1	187.8	113.5	589.8
Jalisco	La Barca	14018	1,583.6	77.6	1,074.1	2,922.0	605.2	379.3	1,333.2
Jalisco	Bolaños	14019	47.5	2.6	240.3	1,062.7	130.9	109.5	194.7
Jalisco	Cabo Corrientes	14020	75.1	6.4	273.1	737.1	107.2	75.1	837.8
Jalisco	Casimiro Castillo	14021	403.1	346.7	3,428.5	1,978.9	700.2	350.3	974.8
Jalisco	Cihuatlán	14022	249.1	40.3	498.2	1,121.2	100.2	75.9	523.8
Jalisco	Zapotlán el Grande	14023	550.8	184.3	1,266.9	2,662.6	228.4	137.6	2,937.0
Jalisco	Cocula	14024	250.3	36.6	475.7	1,371.2	197.3	121.1	1,226.4
Jalisco	Colotlán	14025	110.4	22.9	274.9	733.6	52.7	43.1	232.0
Jalisco	Concepción de Buenos Aires	14026	124.9	7.8	158.7	553.6	105.9	65.0	501.5
Jalisco	Cuautitlán de García Barragán	14027	270.2	15.0	674.4	2,584.9	395.1	291.7	1,023.4

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Jalisco	Cuautla	14028	35.0	2.5	61.7	201.7	46.7	24.9	292.4
Jalisco	Cuquío	14029	199.2	11.6	394.3	1,217.7	257.1	142.7	934.4
Jalisco	Chapala	14030	416.7	300.7	677.1	1,395.2	128.9	89.3	1,176.6
Jalisco	Chimaltitán	14031	30.1	1.9	138.0	530.7	79.4	58.5	171.4
Jalisco	Chiquilistlán	14032	42.5	5.9	152.8	540.1	87.0	58.3	445.6
Jalisco	Degollado	14033	282.0	29.6	382.2	1,052.1	176.4	105.5	1,044.7
Jalisco	Ejutla	14034	15.7	1.4	40.1	93.9	30.5	11.7	157.0
Jalisco	Encarnación de Díaz	14035	428.6	72.0	691.6	1,581.8	321.9	132.2	3,089.2
Jalisco	Etzatlán	14036	238.2	28.4	321.2	818.9	133.3	77.0	526.2
Jalisco	El Grullo	14037	154.9	31.9	395.3	1,260.4	134.9	92.5	192.9
Jalisco	Guachinango	14038	61.0	3.0	215.9	931.1	160.2	104.1	653.1
Jalisco	Guadalajara	14039	24,378.2	9,438.2	54,296.6	220,730.0	3,170.9	2,472.1	1,647.9
Jalisco	Hostotipaquito	14040	166.5	8.0	183.0	567.5	90.7	62.4	445.8
Jalisco	Huejúcar	14041	33.3	5.7	93.9	251.8	32.7	16.8	138.2
Jalisco	Huejuquilla el Alto	14042	47.3	7.3	178.3	552.4	70.8	47.7	243.0
Jalisco	La Huerta	14043	297.8	22.2	492.1	1,207.4	210.8	127.8	1,356.9
Jalisco	Ixtlahuacán de los Membrillos	14044	326.8	194.0	955.0	814.5	136.8	76.2	948.6
Jalisco	Ixtlahuacán del Río	14045	348.9	18.4	401.2	1,155.5	268.0	143.2	1,324.4
Jalisco	Jalostotitlán	14046	147.9	55.3	446.8	980.4	116.2	60.0	1,580.8
Jalisco	Jamay	14047	436.7	28.6	411.5	1,120.7	236.6	134.7	209.2
Jalisco	Jesús María	14048	109.5	39.1	405.4	1,028.9	251.1	109.2	1,263.7
Jalisco	Jilotlán de los Dolores	14049	170.7	5.2	266.5	781.3	264.2	117.3	1,713.1
Jalisco	Jocotepec	14050	386.1	51.2	800.8	1,598.7	212.5	136.4	531.7
Jalisco	Juanacatlán	14051	156.4	14.2	173.2	448.1	57.8	37.9	154.1
Jalisco	Juchitlán	14052	31.9	6.0	114.0	291.0	57.5	29.3	397.3
Jalisco	Lagos de Moreno	14053	1,216.3	381.7	2,200.3	4,679.2	827.0	403.6	9,325.9
Jalisco	El Limón	14054	65.8	5.6	103.6	263.5	43.5	24.2	207.9
Jalisco	Magdalena	14055	243.4	29.1	295.0	717.5	99.6	63.0	298.9
Jalisco	Santa María del Oro	14056	16.9	1.1	80.4	249.6	161.8	44.4	2,606.0
Jalisco	La Manzanilla de la Paz	14057	22.4	3.2	65.3	176.4	37.9	16.3	370.4
Jalisco	Mascota	14058	184.8	19.1	419.7	1,549.2	245.3	165.6	795.8
Jalisco	Mazamitla	14059	68.4	13.7	230.2	707.6	97.6	63.6	408.6
Jalisco	Mexticacán	14060	34.6	3.6	116.1	313.3	54.8	27.0	239.7
Jalisco	Mezquitic	14061	127.8	6.6	642.5	2,756.8	324.1	286.2	683.0
Jalisco	Mixtlán	14062	73.5	3.1	170.5	754.0	119.6	83.2	387.1
Jalisco	Ocotlán	14063	1,183.4	352.8	2,054.7	2,899.7	347.2	235.1	403.0
Jalisco	Ojuelos de Jalisco	14064	374.1	26.6	470.8	1,286.7	385.6	163.4	2,221.7
Jalisco	Pihuamo	14065	132.1	11.8	335.7	1,129.5	241.1	123.8	1,925.5

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Jalisco	Poncitlán	14066	1,166.2	7,467.0	2,594.2	2,238.3	729.4	513.6	744.8
Jalisco	Puerto Vallarta	14067	1,584.7	429.4	3,297.3	8,874.1	284.6	222.6	633.5
Jalisco	Villa Purificación	14068	94.2	7.9	460.0	1,357.6	222.4	144.5	1,339.2
Jalisco	Quitupan	14069	133.0	4.4	343.3	1,271.1	183.8	132.4	580.1
Jalisco	El Salto	14070	1,442.7	1,286.9	4,387.8	4,433.0	284.8	209.4	522.3
Jalisco	San Cristóbal de la Barranca	14071	32.9	1.7	106.3	350.5	83.4	41.8	966.9
Jalisco	San Diego de Alejandría	14072	37.6	11.1	105.1	252.0	62.0	23.4	606.6
Jalisco	San Juan de los Lagos	14073	333.3	58.5	764.8	1,810.9	288.2	127.2	6,302.5
Jalisco	San Julián	14074	72.5	18.2	198.0	457.2	43.3	21.9	930.8
Jalisco	San Marcos	14075	50.0	4.6	65.1	162.1	51.9	21.2	345.5
Jalisco	San Martín de Bolaños	14076	31.5	14.5	132.7	527.4	68.1	54.0	163.0
Jalisco	San Martín Hidalgo	14077	393.8	27.3	493.3	1,364.6	287.0	150.2	889.5
Jalisco	San Miguel el Alto	14078	150.4	78.8	436.0	922.4	121.8	55.9	1,942.1
Jalisco	Gómez Farías	14079	209.6	26.7	417.7	1,533.0	208.4	158.9	1,279.6
Jalisco	San Sebastián del Oeste	14080	67.2	3.0	153.8	477.7	94.8	56.3	467.8
Jalisco	Santa María de los Angeles	14081	21.4	1.7	75.3	228.5	26.4	18.2	83.5
Jalisco	Sayula	14082	190.8	47.8	482.3	1,135.0	124.4	75.2	2,441.0
Jalisco	Tala	14083	723.7	882.2	1,327.1	3,542.8	1,577.8	720.9	1,048.2
Jalisco	Talpa de Allende	14084	165.6	16.8	679.2	3,078.5	416.8	321.0	989.0
Jalisco	Tamazula de Gordiano	14085	629.5	1,943.2	1,167.7	3,384.4	1,435.9	694.4	1,917.6
Jalisco	Tapalpa	14086	134.8	17.2	414.0	1,487.2	197.6	149.4	904.2
Jalisco	Tecalitlán	14087	151.7	17.1	562.8	2,223.8	353.6	229.4	1,712.1
Jalisco	Tecolotlán	14088	365.9	241.1	364.4	1,116.9	372.1	294.3	808.1
Jalisco	Techaluta de Montenegro	14089	47.1	2.0	57.8	166.9	27.7	15.2	182.3
Jalisco	Tenamaxtlán	14090	193.1	9.5	152.1	411.0	104.3	57.0	612.5
Jalisco	Teocaltiche	14091	310.3	52.1	639.3	1,608.3	302.4	148.8	1,110.1
Jalisco	Teocuitatlán de Corona	14092	194.9	11.1	248.8	686.0	182.1	90.3	1,040.7
Jalisco	Tepatitlán de Morelos	14093	607.0	277.6	1,821.4	3,758.0	452.7	210.5	6,856.0
Jalisco	Tequila	14094	308.9	68.1	601.4	1,398.7	140.1	104.4	724.2
Jalisco	Teuchitlán	14095	67.4	5.2	130.5	392.3	61.5	29.1	812.2
Jalisco	Tizapán el Alto	14096	107.7	12.8	311.8	860.8	97.9	62.5	515.3
Jalisco	Tlajomulco de Zúñiga	14097	1,919.8	704.6	2,807.6	6,647.5	505.4	351.7	1,285.7
Jalisco	Tlaquepaque	14098	6,947.2	1,951.1	13,313.2	62,193.7	893.7	671.1	991.4
Jalisco	Tolimán	14099	72.6	5.4	223.3	749.2	128.7	82.0	436.4
Jalisco	Tomatlán	14100	502.3	24.3	953.4	3,370.4	593.5	368.8	5,397.5
Jalisco	Tonalá	14101	4,519.9	744.5	8,652.1	43,071.0	525.1	420.9	1,186.9
Jalisco	Tonaya	14102	71.8	9.8	200.6	751.6	107.3	78.4	241.2
Jalisco	Tonila	14103	69.8	6.5	126.1	393.1	53.3	32.4	164.1

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Jalisco	Totatiche	14104	26.5	2.9	95.2	289.8	26.8	22.6	164.5
Jalisco	Tototlán	14105	410.1	21.5	385.2	1,114.1	212.0	131.3	2,023.3
Jalisco	Tuxcacuesco	14106	40.8	2.2	103.2	342.8	62.4	38.9	286.6
Jalisco	Tuxcueca	14107	51.4	3.8	98.6	271.8	51.2	24.4	589.7
Jalisco	Tuxpan	14108	674.7	3,897.6	713.3	1,963.0	504.1	316.7	1,004.2
Jalisco	Unión de San Antonio	14109	190.2	25.0	287.2	742.3	159.2	76.9	667.4
Jalisco	Unión de Tula	14110	234.2	16.4	265.3	670.2	156.4	83.4	304.9
Jalisco	Valle de Guadalupe	14111	37.3	5.3	89.1	213.3	43.2	17.6	809.3
Jalisco	Valle de Juárez	14112	36.1	7.8	110.6	311.4	46.0	26.4	350.4
Jalisco	San Gabriel	14113	161.4	12.3	403.7	1,527.1	263.2	170.0	823.6
Jalisco	Villa Corona	14114	193.3	18.2	282.1	922.7	132.5	81.8	419.2
Jalisco	Villa Guerrero	14115	44.7	5.5	196.4	826.9	87.9	77.7	192.9
Jalisco	Villa Hidalgo	14116	94.2	57.1	263.2	501.9	101.9	37.1	1,077.0
Jalisco	Cañadas de Obregón	14117	22.2	2.7	77.1	213.2	46.7	20.9	290.3
Jalisco	Yahualica de González Gallo	14118	133.7	28.1	400.8	1,021.4	149.7	81.1	898.0
Jalisco	Zacoalco de Torres	14119	437.5	285.6	483.7	1,204.3	200.6	132.3	572.5
Jalisco	Zapopan	14120	15,031.1	5,016.3	30,719.9	125,341.7	2,094.0	1,522.4	3,968.8
Jalisco	Zapotiltic	14121	481.1	73.6	591.0	1,781.1	259.2	172.8	558.2
Jalisco	Zapotitlán de Vadillo	14122	41.9	3.5	199.8	742.7	123.9	81.7	570.6
Jalisco	Zapotlán del Rey	14123	538.5	16.7	364.5	1,170.9	266.5	170.7	553.8
Jalisco	Zapotlanejo	14124	368.5	133.2	968.6	2,113.2	258.9	159.0	2,429.1
Jalisco Total			84,237.2	39,560.0	172,689.5	607,440.1	33,753.3	20,823.6	138,023.5
Méjico	Acambay	15001	324.7	28.9	1,379.0	4,229.3	559.7	397.8	206.3
Méjico	Acolman	15002	5,947.5	177.7	1,220.7	3,815.9	253.8	218.4	99.1
Méjico	Aculco	15003	192.4	43.9	845.8	2,357.5	313.9	207.1	173.5
Méjico	Almoloya de Alquisiras	15004	68.3	7.6	364.2	1,128.6	125.3	99.7	65.6
Méjico	Almoloya de Juárez	15005	799.6	90.2	2,380.0	6,932.9	821.5	612.6	275.3
Méjico	Almoloya del Río	15006	73.4	27.2	154.8	307.9	19.3	15.8	18.0
Méjico	Amanalco	15007	129.9	7.8	596.2	2,064.9	261.3	210.6	82.2
Méjico	Amatepec	15008	131.7	15.8	846.3	2,657.5	343.4	261.6	212.0
Méjico	Amecameca	15009	179.9	42.9	729.7	1,757.0	125.2	89.1	96.5
Méjico	Apaxco	15010	1,078.6	1,413.0	421.4	872.1	421.6	283.4	50.3
Méjico	Atenco	15011	226.5	68.6	828.0	1,975.9	57.1	33.1	83.4
Méjico	Atizapán	15012	73.9	29.9	199.2	689.2	15.1	11.1	11.0
Méjico	Atizapán de Zaragoza	15013	3,595.6	1,073.2	9,895.1	32,207.0	530.4	414.4	524.8
Méjico	Atlatomulco	15014	429.9	325.2	1,907.1	3,881.7	424.1	292.3	4,102.1
Méjico	Atlautla	15015	114.0	22.1	521.9	1,551.3	140.9	118.3	67.7
Méjico	Axapusco	15016	240.1	21.3	354.4	907.7	115.6	71.3	80.4

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México	Ayapango	15017	53.8	9.4	96.9	226.1	29.5	15.2	17.9
México	Calimaya	15018	173.8	24.7	529.1	1,289.8	108.1	66.6	72.0
México	Capulhuac	15019	123.7	108.0	766.5	895.3	36.7	27.0	43.7
México	Coacalco de Berriozábal	15020	2,288.1	317.7	5,652.3	23,544.6	208.0	160.0	280.2
México	Coatepec Harinas	15021	153.7	16.9	825.2	2,638.1	294.3	232.3	3,055.4
México	Cocotitlán	15022	37.0	5.9	136.0	319.1	26.0	11.8	18.5
México	Coyotepec	15023	150.7	26.1	510.2	1,183.1	50.8	43.4	55.2
México	Cuautitlán	15024	755.7	597.1	2,935.7	6,438.8	97.4	73.6	99.6
México	Chalco	15025	1,603.7	635.8	4,494.1	15,110.9	341.0	249.0	308.2
México	Chapa de Mota	15026	101.5	17.9	534.7	1,663.5	173.9	145.9	111.9
México	Chapultepec	15027	27.7	9.0	85.9	175.0	11.6	6.1	10.7
México	Chiautla	15028	135.8	20.1	321.4	1,056.7	24.8	18.2	29.6
México	Chicoloapan	15029	730.9	148.4	1,754.8	7,280.2	83.5	62.5	104.2
México	Chiconcuac	15030	163.0	51.1	448.9	1,638.3	16.9	13.4	23.8
México	Chimalhuacán	15031	4,372.8	491.7	10,197.6	45,335.1	421.7	325.6	540.9
México	Donato Guerra	15032	130.8	12.0	759.2	2,651.7	313.6	260.5	90.5
México	Ecatepec de Morelos	15033	15,927.7	5,614.0	41,331.1	152,186.3	1,860.1	1,462.2	1,560.1
México	Ecatzingo	15034	33.1	4.3	188.3	626.0	68.8	57.0	37.1
México	Huehuetoca	15035	183.2	235.6	1,255.4	1,135.2	73.9	37.4	73.7
México	Hueypoxtla	15036	275.7	19.8	508.0	1,335.5	156.6	93.2	112.7
México	Huixquilucan	15037	1,393.9	210.1	3,632.4	13,335.4	205.5	151.9	276.9
México	Isidro Fabela	15038	32.3	3.2	137.1	387.1	32.4	24.7	30.1
México	Ixtapaluca	15039	2,563.4	885.0	6,520.2	24,511.1	421.9	324.8	397.9
México	Ixtapan de la Sal	15040	122.7	31.4	612.3	1,504.7	111.0	96.7	70.8
México	Ixtapan del Oro	15041	28.8	9.4	185.6	607.3	76.7	60.6	36.6
México	Ixtlahuaca	15042	1,293.0	83.7	2,504.8	7,471.8	907.1	703.1	235.7
México	Xalatlaco	15043	74.2	25.2	374.2	883.2	66.6	54.2	60.3
México	Jaltenco	15044	161.9	35.8	494.7	1,459.6	24.7	16.9	42.4
México	Jilotepec	15045	348.4	119.7	1,458.6	3,827.8	394.6	298.4	2,732.6
México	Jilotzingo	15046	57.6	5.0	228.0	629.9	43.0	33.4	51.6
México	Jiquipilco	15047	308.3	24.4	1,321.6	4,151.8	495.6	382.3	152.3
México	Jocotitlán	15048	504.7	125.9	1,271.9	2,740.2	363.9	239.9	132.1
México	Joquicingo	15049	49.4	9.1	210.2	580.7	63.4	45.1	30.5
México	Juchitepec	15050	212.6	18.9	336.3	1,038.3	135.5	89.2	60.8
México	Lerma	15051	870.6	4,208.0	4,363.0	4,295.7	559.8	402.7	181.8
México	Malinalco	15052	100.8	16.6	501.2	1,503.0	128.2	122.9	85.5
México	Melchor Ocampo	15053	309.3	60.2	769.7	3,111.2	33.5	26.4	52.0
México	Metepec	15054	1,317.6	310.3	3,730.1	12,051.3	193.2	132.7	257.2

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México	Mexicalzingo	15055	34.0	11.9	136.9	272.8	11.8	6.7	14.5
México	Morelos	15056	141.6	36.8	705.0	2,227.7	278.6	215.5	97.8
México	Naucalpan de Juárez	15057	8,511.1	5,860.0	27,656.3	79,102.1	1,305.9	1,004.1	846.4
México	Nezahualcóyotl	15058	11,166.9	1,904.1	28,474.9	114,321.5	993.0	768.8	1,163.9
México	Nextlalpan	15059	170.2	19.6	365.5	1,326.3	38.7	21.4	44.2
México	Nicolás Romero	15060	2,203.8	551.4	5,544.9	22,448.6	362.8	271.2	357.2
México	Nopaltepec	15061	140.6	16.7	137.0	309.2	44.2	28.1	26.8
México	Ocoyoacac	15062	290.5	206.6	1,009.9	2,057.7	107.4	69.8	94.6
México	Ocuilan	15063	132.0	11.0	620.8	2,017.3	224.2	183.1	126.0
México	El Oro	15064	163.6	21.6	686.9	1,946.5	215.3	164.5	83.9
México	Otumba	15065	195.4	25.7	488.1	1,200.2	95.3	69.6	90.3
México	Otzoloapan	15066	22.4	2.4	136.9	445.7	58.6	45.3	49.2
México	Otzolotepec	15067	259.8	84.7	1,004.4	2,728.6	227.6	179.2	104.6
México	Ozumba	15068	106.6	30.1	385.5	898.2	54.3	42.5	39.9
México	Papalotla	15069	29.9	6.4	76.4	316.3	5.4	3.7	5.2
México	La Paz	15070	1,462.5	1,169.2	4,886.0	12,183.1	240.9	175.4	237.3
México	Polotitlán	15071	117.4	33.7	209.3	404.4	64.7	30.2	51.5
México	Rayón	15072	43.3	27.8	151.1	284.0	24.2	12.1	17.4
México	San Antonio la Isla	15073	40.4	48.4	206.1	324.1	205.6	52.8	16.0
México	San Felipe del Progreso	15074	1,072.2	69.6	4,734.5	16,300.0	1,631.1	1,542.6	469.1
México	San Martín de las Pirámides	15075	98.1	47.7	325.5	646.8	30.2	22.9	45.8
México	San Mateo Atenco	15076	485.3	402.1	1,619.9	4,178.7	84.3	68.1	79.7
México	San Simón de Guerrero	15077	28.1	2.1	137.5	454.4	55.4	43.2	46.1
México	Santo Tomás	15078	36.3	4.7	206.4	562.4	76.2	53.1	37.8
México	Soyaniquilpan de Juárez	15079	87.0	24.0	199.6	472.7	79.6	43.0	60.3
México	Sultepec	15080	120.9	10.6	796.1	2,705.1	296.1	261.3	204.2
México	Tecámac	15081	801.8	352.0	2,809.9	5,798.6	250.7	132.0	253.5
México	Tejupilco	15082	417.9	64.1	2,200.7	6,556.6	622.0	568.6	3,836.5
México	Temamatla	15083	32.3	6.5	125.9	308.8	29.9	14.1	15.2
México	Temascalapa	15084	264.7	26.1	479.8	1,092.4	228.2	94.7	86.4
México	Temascalcingo	15085	359.7	82.6	1,347.9	3,949.5	366.9	320.0	181.6
México	Temascaltepec	15086	179.4	10.9	857.8	2,864.3	379.3	289.2	190.1
México	Temoaya	15087	391.6	38.4	1,598.4	5,165.0	500.1	454.0	134.3
México	Tenancingo	15088	314.7	105.5	1,427.8	3,574.2	237.5	211.8	139.2
México	Tenango del Aire	15089	53.4	5.1	126.0	273.5	87.5	25.4	26.4
México	Tenango del Valle	15090	304.6	105.9	1,326.9	2,954.4	189.8	175.4	127.0
México	Teoloyucán	15091	517.6	88.0	1,314.9	5,158.0	67.7	50.0	95.0
México	Teotihuacán	15092	303.7	81.3	847.6	2,663.5	59.6	40.4	76.5

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México	Tepetlaotoc	15093	131.2	31.7	381.6	1,154.0	48.9	36.7	69.2
México	Tepetlixpa	15094	90.3	10.2	275.7	757.0	68.0	47.7	32.4
México	Tepotzotlán	15095	481.4	369.4	1,719.7	4,462.0	102.4	72.5	130.1
México	Tequixquiac	15096	164.1	35.3	426.3	950.6	101.1	48.9	69.8
México	Texcaltitlán	15097	75.1	9.4	437.9	1,458.1	146.1	134.2	72.3
México	Texcalyacac	15098	24.7	8.7	82.3	233.2	56.9	25.0	8.8
México	Texcoco	15099	1,385.4	459.7	4,023.5	12,859.2	258.3	185.0	3,780.5
México	Tezoyuca	15100	144.8	20.4	370.4	1,341.0	62.3	23.9	28.1
México	Tianguistenco	15101	278.4	444.6	2,713.9	2,556.0	191.7	159.8	114.2
México	Timilpan	15102	101.0	5.9	310.2	928.9	98.0	79.6	66.2
México	Tlalmanalco	15103	178.5	120.1	720.0	1,389.8	52.3	44.1	107.6
México	Tlalnepantla de Báez	15104	8,254.8	5,941.1	27,207.7	67,732.5	1,454.7	1,045.9	791.4
México	Tlatlaya	15105	167.8	9.4	989.7	3,269.1	494.8	342.7	283.8
México	Toluca	15106	5,633.4	4,678.4	22,256.6	41,332.3	1,556.1	1,302.2	4,485.8
México	Tonatico	15107	59.9	10.6	199.7	469.6	32.8	26.0	34.6
México	Tultepec	15108	638.0	274.3	2,707.2	5,868.7	74.6	58.5	121.8
México	Tultitlán	15109	4,517.8	1,595.6	9,703.4	23,952.1	502.8	359.5	480.7
México	Valle de Bravo	15110	273.8	66.6	1,253.8	2,923.6	345.9	220.8	3,530.9
México	Villa de Allende	15111	199.8	17.5	1,121.2	3,961.5	433.3	386.7	141.4
México	Villa del Carbón	15112	185.5	26.0	888.0	2,813.7	274.5	244.1	135.9
México	Villa Guerrero	15113	221.5	28.1	1,031.8	2,967.7	381.2	248.7	127.5
México	Villa Victoria	15114	414.7	28.2	1,978.6	6,704.6	669.9	630.1	202.9
México	Xonacatlán	15115	177.6	46.9	686.2	1,701.7	100.7	88.5	68.3
México	Zacazonapan	15116	15.3	2.5	82.6	229.1	51.8	25.5	26.3
México	Zacualpan	15117	73.7	13.3	451.9	1,508.2	243.0	159.3	102.7
México	Zinacantepec	15118	747.2	234.6	2,300.5	6,993.6	352.0	307.9	239.4
México	Zumpahuacán	15119	68.0	6.4	432.9	1,557.6	189.3	153.4	83.8
México	Zumpango	15120	689.3	127.2	1,723.6	5,700.9	216.1	107.9	5,653.9
México	Cuautitlán Izcalli	15121	4,320.3	2,788.8	15,229.0	41,118.6	677.5	454.7	516.3
México	Valle de Chalco Solidaridad	15122	2,357.4	361.7	5,856.0	22,251.4	420.7	228.7	345.4
México Total			113,950.3	47,310.8	327,553.2	999,795.4	32,670.6	24,906.1	49,104.8
Michoacán	Acuitzio	16001	43.5	5.2	241.7	805.7	98.1	76.4	516.1
Michoacán	Aguililla	16002	138.0	9.5	512.6	1,690.6	253.4	175.1	1,489.6
Michoacán	Alvaro Obregón	16003	272.1	15.0	353.7	1,020.2	151.3	91.4	469.1
Michoacán	Angamacutiro	16004	207.2	9.3	290.9	873.6	138.5	90.2	944.9
Michoacán	Angangueo	16005	61.9	4.7	229.3	749.8	78.6	68.8	88.6
Michoacán	Apatzingán	16006	578.0	125.6	1,915.1	4,390.1	410.2	312.6	1,997.1
Michoacán	Aporo	16007	37.9	1.3	68.1	210.6	29.7	21.3	51.1

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Michoacán	Aquila	16008	114.7	7.0	687.4	2,289.9	322.3	253.1	1,319.7
Michoacán	Ario	16009	161.4	17.7	775.3	2,712.3	343.1	263.2	336.2
Michoacán	Arteaga	16010	323.8	14.2	568.9	1,773.8	242.8	185.8	2,514.8
Michoacán	Briseñas	16011	188.9	5.6	167.8	450.7	98.6	54.9	146.7
Michoacán	Buenavista	16012	335.0	21.4	826.4	2,585.9	332.3	249.2	1,010.3
Michoacán	Carácuaro	16013	43.1	4.4	272.6	922.3	144.8	102.6	821.3
Michoacán	Coahuayana	16014	146.8	6.7	297.1	838.0	99.6	84.1	357.9
Michoacán	Coalcomán de Vázquez Pallares	16015	180.4	11.2	971.9	4,232.3	547.6	437.3	2,031.1
Michoacán	Coeneo	16016	158.2	8.2	413.2	1,235.1	161.8	109.0	930.0
Michoacán	Contepec	16017	324.5	10.8	686.1	2,405.1	336.7	245.8	545.2
Michoacán	Copándaro	16018	35.4	3.4	174.8	589.4	60.9	51.5	198.8
Michoacán	Cotija	16019	132.2	12.3	517.5	1,929.0	216.8	169.2	769.1
Michoacán	Cuitzeo	16020	113.7	12.0	453.8	1,227.5	109.5	88.2	336.6
Michoacán	Charapan	16021	70.0	6.5	366.8	1,404.5	176.1	145.6	257.7
Michoacán	Charo	16022	122.0	5.5	333.3	1,082.8	132.4	95.3	672.3
Michoacán	Chavinda	16023	183.8	6.7	187.4	541.3	89.3	56.5	205.0
Michoacán	Cherán	16024	95.6	11.3	469.5	1,572.1	178.3	155.6	245.6
Michoacán	Chilchota	16025	176.6	14.6	891.7	3,124.6	341.5	301.4	332.6
Michoacán	Chinicuila	16026	35.9	2.3	234.1	767.7	158.9	95.4	1,037.2
Michoacán	Chucándiro	16027	32.2	2.5	137.9	445.3	56.0	40.1	220.5
Michoacán	Churintzio	16028	100.8	4.1	125.6	333.2	52.3	33.5	353.0
Michoacán	Churumuco	16029	68.0	6.3	396.1	1,373.7	187.4	147.6	1,254.4
Michoacán	Ecuandureo	16030	223.5	7.0	248.4	714.6	110.6	70.4	525.8
Michoacán	Epitacio Huerta	16031	164.2	6.1	372.9	1,153.2	185.5	126.3	498.3
Michoacán	Erongarícuaro	16032	130.7	5.2	317.4	969.6	125.3	96.3	253.5
Michoacán	Gabriel Zamora	16033	183.3	12.1	382.7	1,074.7	131.1	100.1	704.9
Michoacán	Hidalgo	16034	488.1	168.1	2,352.0	6,495.9	652.9	547.8	1,068.8
Michoacán	La Huacana	16035	259.3	16.9	880.4	2,853.8	389.2	302.8	2,654.0
Michoacán	Huandacareo	16036	54.3	7.1	182.0	473.3	43.1	30.8	401.6
Michoacán	Huaniqueo	16037	46.9	3.2	185.4	570.4	86.6	53.3	489.0
Michoacán	Huetamo	16038	221.5	28.0	915.4	2,640.0	334.3	248.2	2,472.5
Michoacán	Huiramba	16039	39.7	2.4	119.1	388.0	46.7	34.0	209.8
Michoacán	Indaparapeo	16040	192.0	33.9	328.9	1,095.6	167.5	107.7	322.0
Michoacán	Irimbo	16041	90.1	9.7	244.7	663.6	72.1	53.5	152.0
Michoacán	Ixtlán	16042	142.9	5.9	239.6	710.6	104.9	66.2	367.5
Michoacán	Jacona	16043	298.0	31.2	887.5	1,674.7	87.3	74.4	209.7
Michoacán	Jiménez	16044	179.0	7.2	255.4	687.6	126.4	70.9	877.0
Michoacán	Jiquilpan	16045	140.5	24.6	582.7	1,345.8	118.6	81.7	592.3

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Michoacán	Juárez	16046	49.6	4.0	202.4	633.8	63.9	53.6	270.4
Michoacán	Jungapeo	16047	80.0	6.1	374.7	1,272.3	143.3	118.5	329.0
Michoacán	Lagunillas	16048	45.3	2.4	89.4	261.8	32.3	21.9	596.3
Michoacán	Madero	16049	78.0	7.2	467.3	1,676.2	246.2	176.4	634.8
Michoacán	Maravatío	16050	509.9	39.1	1,245.1	3,651.1	459.8	320.3	931.0
Michoacán	Marcos Castellanos	16051	63.1	6.6	181.8	424.4	55.3	29.2	1,426.1
Michoacán	Lázaro Cárdenas	16052	18,124.8	19,833.3	5,402.0	6,799.5	3,050.0	2,821.2	1,715.1
Michoacán	Morelia	16053	4,919.2	3,646.5	13,326.4	44,345.9	1,894.0	1,312.6	2,691.4
Michoacán	Morelos	16054	51.6	4.2	222.3	692.0	80.8	62.5	594.5
Michoacán	Múgica	16055	290.6	29.2	711.4	1,825.0	161.6	140.0	604.5
Michoacán	Nahuatzen	16056	126.9	11.8	672.4	2,154.1	256.5	218.7	279.1
Michoacán	Nocupéitaro	16057	47.2	3.5	284.2	1,113.5	158.9	120.4	720.4
Michoacán	Nuevo Parangaricutiro	16058	89.9	11.8	386.9	1,139.6	111.1	97.4	191.9
Michoacán	Nuevo Urecho	16059	124.8	4.9	231.5	792.7	103.1	82.6	324.5
Michoacán	Numarán	16060	221.5	6.6	190.7	624.0	98.9	73.0	187.2
Michoacán	Ocampo	16061	115.7	7.5	512.6	1,849.2	215.2	187.5	136.8
Michoacán	Pajacuarán	16062	236.8	11.0	366.8	1,054.5	185.8	112.3	513.0
Michoacán	Panindícuaro	16063	125.5	6.4	354.5	1,115.0	145.5	102.5	629.6
Michoacán	Parácuaro	16064	310.3	12.5	519.4	1,610.5	211.3	169.9	711.0
Michoacán	Paracho	16065	170.5	21.3	906.8	2,217.9	240.4	201.4	251.1
Michoacán	Pátzcuaro	16066	428.2	67.7	1,506.2	3,876.1	334.2	290.9	491.7
Michoacán	Penjamillo	16067	250.7	8.9	393.1	1,247.2	209.3	135.1	405.5
Michoacán	Peribán	16068	87.6	13.3	412.8	1,335.9	134.4	105.1	409.6
Michoacán	La Piedad	16069	466.9	93.7	1,396.8	2,633.1	162.8	121.8	978.6
Michoacán	Purépero	16070	65.2	10.3	250.3	489.9	43.5	23.1	397.1
Michoacán	Puruándiro	16071	541.2	42.5	1,216.0	3,476.6	431.6	301.3	783.0
Michoacán	Queréndaro	16072	105.5	7.6	261.3	821.4	112.1	79.4	372.7
Michoacán	Quiroga	16073	144.4	18.8	619.3	1,269.7	122.2	99.2	179.1
Michoacán	Cojumatlán de Régules	16074	58.9	4.0	170.5	525.4	56.1	43.8	288.4
Michoacán	Los Reyes	16075	350.2	415.2	1,207.7	3,342.6	657.3	398.2	867.0
Michoacán	Sahuayo	16076	328.2	56.2	1,025.3	1,939.9	130.0	98.0	453.8
Michoacán	San Lucas	16077	97.3	7.9	377.9	1,094.4	141.9	103.0	727.8
Michoacán	Santa Ana Maya	16078	67.4	6.7	219.4	623.9	68.6	46.9	391.0
Michoacán	Salvador Escalante	16079	220.5	18.7	994.3	2,979.1	388.3	296.1	418.9
Michoacán	Senguio	16080	139.2	5.5	370.7	1,238.7	161.5	123.4	142.4
Michoacán	Susupuato	16081	40.2	2.7	256.0	947.2	127.1	101.9	316.5
Michoacán	Tacámbaro	16082	350.4	192.7	1,482.5	4,995.7	811.4	551.0	594.7
Michoacán	Tancítaro	16083	147.1	10.2	800.7	3,069.5	361.6	306.5	490.1

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Michoacán	Tangamandapio	16084	127.0	10.8	601.7	1,969.7	230.1	188.6	394.9
Michoacán	Tangancícuaro	16085	273.9	22.0	648.4	1,874.6	196.9	162.3	513.1
Michoacán	Tanhuato	16086	225.4	8.3	251.9	798.4	132.9	85.4	321.1
Michoacán	Taretan	16087	1,106.5	297.0	384.2	1,244.7	2,363.8	695.3	1,366.4
Michoacán	Tarímbaro	16088	215.1	14.5	638.6	1,767.4	200.2	136.5	600.2
Michoacán	Tepalcatepec	16089	322.5	20.0	467.5	1,157.4	233.7	134.1	1,562.1
Michoacán	Tingambato	16090	81.6	7.2	350.9	1,075.8	120.7	102.8	187.2
Michoacán	Tingüindín	16091	176.4	7.0	468.9	1,980.8	224.8	190.0	301.8
Michoacán	Tiquicheo de Nicolás Romero	16092	73.0	6.1	422.7	1,455.2	211.1	157.3	1,449.4
Michoacán	Tlalpujahua	16093	118.2	9.4	656.9	2,080.3	232.5	197.0	251.7
Michoacán	Tlazazalca	16094	43.2	3.9	152.4	417.7	51.9	33.6	625.4
Michoacán	Tocumbo	16095	295.2	1,494.7	441.6	1,611.2	476.2	279.3	486.7
Michoacán	Tumbiscatío	16096	70.6	3.9	290.0	972.3	156.7	110.0	1,603.6
Michoacán	Turicato	16097	166.5	14.6	938.4	3,380.4	440.1	353.2	1,430.2
Michoacán	Tuxpan	16098	142.3	11.1	654.0	2,583.3	285.0	239.2	413.3
Michoacán	Tuzantla	16099	91.2	7.5	465.0	1,531.7	242.9	170.3	1,205.3
Michoacán	Tzintzuntzan	16100	70.2	6.1	318.1	866.4	90.2	77.0	144.3
Michoacán	Tzitzio	16101	47.2	3.6	310.1	1,115.5	175.3	123.9	576.7
Michoacán	Uruapan	16102	1,813.9	365.6	6,306.6	18,152.6	874.6	752.0	746.9
Michoacán	Venustiano Carranza	16103	375.0	15.4	416.2	1,081.3	174.8	115.4	380.9
Michoacán	Villamar	16104	267.4	8.3	401.6	1,212.6	190.3	126.9	346.1
Michoacán	Vista Hermosa	16105	349.3	13.2	324.4	986.9	204.5	117.9	356.5
Michoacán	Yurécuaro	16106	310.7	19.0	420.3	1,203.1	143.9	100.0	642.1
Michoacán	Zacapu	16107	700.0	2,782.6	1,291.0	2,646.3	413.7	272.5	660.2
Michoacán	Zamora	16108	1,271.7	256.8	3,105.5	8,533.1	333.1	242.5	801.6
Michoacán	Zináparo	16109	42.2	2.2	72.0	191.1	33.7	18.9	343.7
Michoacán	Zinapécuaro	16110	525.0	28.8	1,019.9	3,365.6	382.1	313.0	550.4
Michoacán	Ziracuaretiro	16111	148.4	6.1	368.8	1,514.6	166.8	145.6	593.1
Michoacán	Zitácuaro	16112	625.5	123.3	2,726.7	8,433.0	828.2	707.2	859.3
Michoacán	José Sixto Verduzco	16113	281.3	14.2	475.7	1,518.7	223.8	147.6	497.2
Michoacán Total			47,362.0	30,976.0	87,059.9	254,969.9	30,733.6	22,406.5	75,908.9
Morelos	Amacuzac	17001	134.1	6.8	308.3	893.6	86.0	75.0	204.2
Morelos	Atlatlahucan	17002	97.8	9.5	239.7	641.8	55.7	41.5	146.2
Morelos	Axochiapan	17003	355.4	21.1	604.3	1,675.1	189.2	155.4	357.1
Morelos	Ayala	17004	594.1	54.8	1,262.1	3,186.7	301.7	254.0	1,419.1
Morelos	Coatlán del Río	17005	52.2	4.3	183.3	546.2	55.0	48.1	161.4
Morelos	Cuautla	17006	1,699.6	3,349.2	3,355.9	8,131.4	896.3	484.8	449.4
Morelos	Cuernavaca	17007	2,902.9	1,699.5	8,688.6	22,983.9	412.3	354.0	723.8

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State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
Morelos	Emiliano Zapata	17008	768.9	727.3	1,086.7	3,205.7	173.3	126.5	791.4
Morelos	Huitzilac	17009	156.7	15.8	285.2	760.0	69.0	59.0	134.6
Morelos	Jantetelco	17010	139.1	7.8	236.1	622.8	65.0	49.8	217.3
Morelos	Jiutepec	17011	1,779.9	2,073.1	6,334.7	10,807.2	375.7	292.4	364.0
Morelos	Jojutla	17012	269.2	57.4	832.0	1,880.1	123.6	101.5	349.5
Morelos	Jonacatepec	17013	158.7	8.5	245.5	654.2	81.3	61.5	206.9
Morelos	Mazatepec	17014	64.5	4.0	159.7	440.1	43.8	36.0	142.1
Morelos	Miacatlán	17015	146.7	13.9	493.9	1,495.8	182.6	142.0	242.7
Morelos	Ocuituco	17016	110.2	6.3	328.0	1,088.4	193.4	117.7	196.9
Morelos	Puente de Ixtla	17017	357.7	34.2	1,032.4	2,888.4	262.6	235.2	1,228.8
Morelos	Temixco	17018	744.2	79.1	1,767.4	6,771.8	193.5	163.9	317.1
Morelos	Tepalcingo	17019	253.3	14.9	524.0	1,521.0	193.8	152.6	453.2
Morelos	Tepoztlán	17020	211.1	20.6	541.6	1,459.8	159.7	127.2	190.0
Morelos	Tetecala	17021	39.7	6.8	120.9	313.7	27.0	23.6	142.3
Morelos	Tetela del Volcán	17022	81.4	8.0	388.9	1,325.0	142.2	125.0	167.5
Morelos	Tlalnepantla	17023	34.2	2.2	139.3	500.8	60.6	49.4	240.2
Morelos	Tlaltizapán	17024	307.1	23.2	750.8	2,129.6	181.2	146.6	328.1
Morelos	Tlaquiltenango	17025	161.6	14.1	555.4	1,721.1	198.3	146.6	323.4
Morelos	Tlayacapan	17026	184.5	9.6	250.0	684.6	76.9	60.1	109.7
Morelos	Totolapan	17027	87.8	4.1	165.3	532.2	69.1	49.0	651.4
Morelos	Xochitepec	17028	268.3	26.2	903.5	2,344.8	134.3	106.1	227.3
Morelos	Yautepéc	17029	558.4	70.6	1,325.8	2,904.6	202.1	168.0	736.1
Morelos	Yecapixtla	17030	299.8	751.4	585.3	1,656.1	236.7	159.6	332.2
Morelos	Zacatepec de Hidalgo	17031	1,409.8	4,728.7	1,546.2	1,818.9	2,747.7	1,335.1	166.0
Morelos	Zacualpan de Amilpas	17032	86.4	4.7	171.1	516.6	59.2	49.5	118.7
Morelos	Temoac	17033	94.9	5.4	227.2	657.5	70.4	55.9	135.5
Morelos Total			14,610.2	13,863.4	35,639.2	88,759.5	8,319.5	5,552.5	11,973.7
Nayarit	Acaponeta	18001	419.7	88.2	703.0	1,642.5	225.9	157.2	1,190.0
Nayarit	Ahuacatlán	18002	135.2	11.9	264.1	705.7	102.1	60.9	478.9
Nayarit	Amatlán de Cañas	18003	95.7	7.4	224.9	556.6	100.1	57.3	451.0
Nayarit	Compostela	18004	661.0	105.3	1,164.2	2,629.6	334.4	230.7	1,539.9
Nayarit	Huajicori	18005	79.0	8.2	391.6	1,572.0	201.4	169.3	1,155.7
Nayarit	Ixtlán del Río	18006	174.4	37.9	377.6	800.5	82.0	50.8	521.3
Nayarit	Jala	18007	78.1	26.2	371.2	1,096.9	136.5	107.0	411.3
Nayarit	Xalisco	18008	254.3	49.1	628.1	2,195.7	221.7	159.9	785.7
Nayarit	Del Nayar	18009	135.6	9.4	789.5	2,952.5	355.7	318.7	1,464.8
Nayarit	Rosamorada	18010	729.8	23.8	702.5	2,012.6	316.8	239.7	1,054.0
Nayarit	Ruiz	18011	186.1	25.9	461.1	1,196.1	159.0	117.7	647.1

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Nayarit	San Blas	18012	451.9	46.3	744.4	1,822.5	265.8	177.7	1,911.9
Nayarit	San Pedro Lagunillas	18013	170.6	6.6	186.0	664.1	120.1	72.7	896.5
Nayarit	Santa María del Oro	18014	268.4	10.9	544.3	2,246.1	337.3	226.5	743.3
Nayarit	Santiago Ixcuintla	18015	1,263.4	93.8	1,516.2	3,709.4	639.8	388.0	1,399.6
Nayarit	Tecuala	18016	586.2	44.4	725.3	1,706.0	361.5	199.5	1,541.8
Nayarit	Tepic	18017	3,181.6	2,113.5	6,987.0	20,039.0	2,725.5	1,205.1	3,729.8
Nayarit	Tuxpan	18018	407.2	45.1	501.0	1,041.1	191.6	107.0	539.1
Nayarit	La Yesca	18019	159.1	3.7	898.9	4,468.5	546.7	464.7	2,478.0
Nayarit	Bahía de Banderas	18020	388.9	98.7	954.5	1,884.6	179.0	124.9	1,047.6
Nayarit Total			9,826.3	2,856.3	19,135.3	54,942.1	7,602.7	4,635.1	23,987.3
Nuevo León	Abasolo	19001	27.6	6.4	44.7	64.8	3.2	2.8	16.6
Nuevo León	Agualegas	19002	32.7	8.2	102.7	113.0	9.3	5.8	299.2
Nuevo León	Los Aldamas	19003	92.3	1.8	41.4	91.7	11.4	9.6	212.1
Nuevo León	Allende	19004	169.9	52.6	384.4	714.2	32.3	28.9	80.6
Nuevo León	Anáhuac	19005	285.4	57.8	371.2	602.2	73.8	45.3	1,383.4
Nuevo León	Apodaca	19006	8,392.7	2,129.3	9,563.1	32,350.3	3,568.7	3,370.8	389.5
Nuevo León	Aramberri	19007	119.0	9.8	336.6	1,068.6	165.7	115.0	792.3
Nuevo León	Bustamante	19008	68.7	4.8	52.9	98.1	6.8	5.3	137.1
Nuevo León	Cadereyta Jiménez	19009	4,849.4	33,240.8	18,919.2	9,611.2	2,434.8	1,618.6	426.6
Nuevo León	Carmen	19010	78.5	98.7	213.2	174.3	13.1	10.6	40.1
Nuevo León	Cerralvo	19011	72.4	22.3	135.1	261.8	25.2	15.7	285.5
Nuevo León	Ciénega de Flores	19012	661.3	173.3	190.2	1,940.4	104.8	91.8	56.6
Nuevo León	China	19013	109.7	24.1	216.4	352.8	35.1	24.0	1,279.6
Nuevo León	Doctor Arroyo	19014	273.4	20.8	768.7	2,270.3	538.8	269.8	1,579.8
Nuevo León	Doctor Coss	19015	61.4	1.4	43.9	91.8	11.5	7.4	198.9
Nuevo León	Doctor González	19016	21.3	9.4	64.7	90.6	10.2	5.7	189.2
Nuevo León	Galeana	19017	506.3	31.3	798.2	2,487.2	447.3	265.8	2,098.7
Nuevo León	García	19018	1,744.3	2,496.7	1,395.6	4,418.3	242.5	213.9	344.9
Nuevo León	San Pedro Garza García	19019	2,287.8	1,016.3	3,647.2	14,303.0	251.1	215.6	182.4
Nuevo León	General Bravo	19020	39.4	7.2	107.3	190.5	20.9	12.6	584.2
Nuevo León	General Escobedo	19021	3,601.4	643.7	7,702.0	26,337.1	402.9	341.9	314.4
Nuevo León	General Terán	19022	177.3	12.6	356.9	1,584.2	227.2	164.1	716.5
Nuevo León	General Treviño	19023	10.2	1.7	32.8	43.8	5.4	2.5	116.1
Nuevo León	General Zaragoza	19024	40.8	4.5	178.6	557.6	61.8	57.3	364.4
Nuevo León	General Zuazua	19025	54.5	129.5	396.4	166.4	16.5	12.1	60.7
Nuevo León	Guadalupe	19026	10,442.3	2,242.9	18,187.8	75,883.6	2,293.2	2,069.8	788.6
Nuevo León	Los Herreras	19027	69.9	2.2	43.6	80.9	6.9	4.8	173.2
Nuevo León	Higueras	19028	8.4	3.2	20.0	39.0	3.0	2.0	191.7

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Nuevo León	Hualahuises	19029	46.8	9.1	107.1	233.8	21.1	16.9	51.2
Nuevo León	Iturbide	19030	22.0	2.0	71.4	239.7	24.3	21.0	217.5
Nuevo León	Juárez	19031	557.2	113.1	1,118.4	2,878.6	80.7	73.5	164.6
Nuevo León	Lampazos de Naranjo	19032	219.7	12.9	95.1	169.4	18.9	12.9	1,017.0
Nuevo León	Linares	19033	633.0	205.6	1,344.1	2,463.2	236.4	189.9	779.7
Nuevo León	Marín	19034	28.4	8.6	73.7	119.0	5.3	4.7	46.4
Nuevo León	Melchor Ocampo	19035	7.2	0.5	17.4	30.5	1.8	1.2	57.1
Nuevo León	Mier y Noriega	19036	48.0	2.9	157.0	537.6	51.7	48.4	271.7
Nuevo León	Mina	19037	92.2	13.8	93.5	181.7	20.7	14.1	1,112.0
Nuevo León	Montemorelos	19038	472.1	130.3	859.7	1,851.6	153.0	125.3	549.4
Nuevo León	Monterrey	19039	25,645.5	47,520.6	36,180.3	129,783.4	4,787.4	4,237.9	1,183.8
Nuevo León	Parás	19040	7.3	0.9	20.4	33.9	3.5	1.7	363.4
Nuevo León	Pesquería	19041	186.3	42.7	2,142.7	582.0	104.1	78.9	106.8
Nuevo León	Los Ramones	19042	139.4	3.6	137.4	558.4	86.1	58.1	355.2
Nuevo León	Rayones	19043	16.8	1.7	60.2	193.7	23.4	19.3	264.6
Nuevo León	Sabinas Hidalgo	19044	605.2	113.8	699.5	930.5	111.5	81.9	470.8
Nuevo León	Salinas Victoria	19045	247.2	57.8	342.1	531.6	34.4	28.8	506.3
Nuevo León	San Nicolás de los Garza	19046	9,757.0	7,462.3	15,596.7	62,634.3	1,331.1	1,182.3	575.6
Nuevo León	Hidalgo	19047	103.4	36.2	220.0	355.4	15.5	13.9	47.8
Nuevo León	Santa Catarina	19048	3,639.3	1,631.4	13,042.7	25,881.9	436.1	360.5	532.4
Nuevo León	Santiago	19049	217.7	70.8	555.5	1,001.9	55.7	49.9	247.9
Nuevo León	Vallecillo	19050	43.0	1.1	42.4	76.6	11.7	7.8	541.7
Nuevo León	Villaldama	19051	80.6	6.1	60.4	129.7	11.6	8.5	338.6
Nuevo León Total			77,113.7	99,901.2	137,352.2	407,386.2	18,649.5	15,626.6	23,104.4
Oaxaca	Abejones	20001	5.6	0.8	44.7	174.1	27.3	19.7	1.7
Oaxaca	Acatlán de Pérez Figueroa	20002	656.3	1,060.5	1,446.6	4,845.5	1,189.3	765.8	50.5
Oaxaca	Asunción Cacalotepec	20003	9.4	1.1	71.7	276.6	35.0	29.5	2.9
Oaxaca	Asunción Cuyotepeji	20004	3.0	0.5	21.2	79.8	10.7	8.3	1.0
Oaxaca	Asunción Ixtaltepec	20005	107.6	6.1	264.5	861.2	120.6	87.2	16.2
Oaxaca	Asunción Nochixtlán	20006	49.0	13.8	279.4	796.2	90.1	69.9	1,226.0
Oaxaca	Asunción Ocotlán	20007	12.2	1.6	77.9	283.9	28.2	26.8	4.1
Oaxaca	Asunción Tlacolulita	20008	5.8	0.4	26.0	94.0	20.6	11.9	1.0
Oaxaca	Ayotzinapepec	20009	64.4	3.3	195.0	759.9	98.7	89.0	6.4
Oaxaca	El Barrio de la Soledad	20010	103.5	21.2	259.8	705.8	82.9	66.0	14.9
Oaxaca	Calihualá	20011	27.3	0.8	140.2	740.6	90.1	78.3	1.5
Oaxaca	Candelaria Loxicha	20012	37.4	3.9	297.6	1,159.8	141.4	127.8	10.8
Oaxaca	Ciénega de Zimatlán	20013	8.8	1.7	42.5	135.9	10.8	9.8	46.0
Oaxaca	Ciudad Ixtepec	20014	142.4	22.8	374.9	1,006.7	95.5	80.3	25.7

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	Coatecas Altas	20015	20.8	1.7	154.4	607.6	70.5	63.5	6.6
Oaxaca	Coicoyán de las Flores	20016	20.9	2.3	158.3	619.1	77.0	65.8	6.5
Oaxaca	La Compañía	20017	16.1	1.2	118.1	463.3	57.1	50.0	4.5
Oaxaca	Concepción Buenavista	20018	11.2	0.4	29.3	111.2	25.6	14.6	1.1
Oaxaca	Concepción Pápalo	20019	11.4	1.1	89.5	350.8	47.6	38.4	3.5
Oaxaca	Constancia del Rosario	20020	38.6	1.2	183.5	891.7	107.6	94.4	3.7
Oaxaca	Cosolapa	20021	172.4	2,295.2	443.6	1,290.4	449.1	244.4	16.4
Oaxaca	Cosoltepec	20022	3.3	0.3	25.7	97.6	16.4	11.1	1.1
Oaxaca	Cuilapam de Guerrero	20023	39.3	5.2	205.6	724.4	64.8	59.8	14.5
Oaxaca	Cuyamecalco Villa de Zaragoza	20024	16.0	1.5	125.4	493.7	59.5	52.8	4.9
Oaxaca	Chahuites	20025	60.1	6.4	176.5	592.4	60.0	56.3	11.1
Oaxaca	Chalcatongo de Hidalgo	20026	42.9	4.8	216.3	818.3	96.5	84.9	8.9
Oaxaca	Chiquihuitlán de Benito Juárez	20027	9.5	1.1	74.1	279.0	33.3	30.4	2.8
H-28	Heroica Ciudad de Ejutla de Crespo	20028	72.2	10.4	426.7	1,406.4	163.2	138.7	1,612.7
	Eloxochitlán de Flores Magón	20029	15.1	1.5	110.9	420.0	47.7	44.6	4.7
Oaxaca	El Espinal	20030	31.3	5.0	92.1	211.9	13.3	10.4	8.7
Oaxaca	Tamazulapam del Espíritu Santo	20031	23.9	2.7	173.0	665.8	75.4	68.4	7.6
Oaxaca	Fresnillo de Trujano	20032	4.1	0.4	30.7	116.1	17.0	13.0	1.3
Oaxaca	Guadalupe Etla	20033	13.2	1.0	32.8	67.8	4.3	3.6	2.3
Oaxaca	Guadalupe de Ramírez	20034	4.6	0.9	27.5	94.7	10.7	9.2	1.6
Oaxaca	Guelatao de Juárez	20035	4.8	0.5	9.7	31.5	2.7	2.3	0.9
Oaxaca	Guevea de Humboldt	20036	20.6	2.0	157.8	593.8	81.2	65.9	6.4
Oaxaca	Mesones Hidalgo	20037	25.3	1.7	107.6	405.8	54.4	44.9	4.7
Oaxaca	Villa Hidalgo	20038	7.6	1.1	56.1	187.5	24.1	19.9	2.4
H-28	Heroica Ciudad de Huajuapan de León	20039	157.4	7.7	771.9	2,029.8	433.0	188.3	1,260.9
	Huautepec	20040	24.0	2.3	180.7	712.0	79.4	74.3	7.4
	Huautla de Jiménez	20041	108.5	16.5	780.2	2,838.7	301.8	283.4	35.2
	Ixtlán de Juárez	20042	33.4	3.7	248.7	714.7	119.6	80.1	1,266.7
	Juchitán de Zaragoza	20043	336.6	65.6	1,347.2	3,385.7	342.6	278.9	2,721.1
	Loma Bonita	20044	262.5	25.8	804.3	2,373.0	262.8	229.0	46.3
	Magdalena Apasco	20045	15.1	1.9	99.1	169.5	14.3	12.0	4.5
	Magdalena Jaltepec	20046	52.0	2.0	95.7	346.4	52.3	40.0	4.2
	Santa Magdalena Jicotlán	20047	8.3	0.3	5.3	18.4	4.9	3.1	0.1
	Magdalena Mixtepec	20048	3.5	0.4	26.2	102.8	12.2	10.9	1.1
Oaxaca	Magdalena Ocotlán	20049	3.5	0.5	22.3	80.6	8.4	7.7	1.2
Oaxaca	Magdalena Peñasco	20050	12.7	1.2	96.6	375.2	46.0	39.8	3.9

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Oaxaca	Magdalena Teitipac	20051	15.7	1.7	97.6	373.6	42.4	39.0	4.1
Oaxaca	Magdalena Tequisistlán	20052	36.4	3.1	151.0	547.5	100.6	64.7	6.8
Oaxaca	Magdalena Tlacotepec	20053	6.4	0.8	26.3	84.6	14.3	9.4	1.3
Oaxaca	Magdalena Zahuatlán	20054	12.1	0.4	14.1	51.3	7.9	6.5	0.5
Oaxaca	Mariscala de Juárez	20055	14.3	2.1	82.2	279.7	37.4	29.7	3.8
Oaxaca	Mártires de Tacubaya	20056	4.9	0.6	38.9	147.2	19.6	16.4	1.4
Oaxaca	Matías Romero	20057	953.4	1,313.8	1,082.2	3,320.5	762.4	574.3	46.1
Oaxaca	Mazatlán Villa de Flores	20058	52.4	4.3	404.0	1,559.9	184.6	169.6	15.8
Oaxaca	Miahuatlán de Porfirio Díaz	20059	110.0	21.6	734.4	2,400.4	266.3	227.9	2,472.0
Oaxaca	Mixistlán de la Reforma	20060	9.9	0.9	74.9	296.7	36.1	31.5	3.0
Oaxaca	Monjas	20061	8.3	0.7	57.9	224.6	24.5	22.7	2.7
Oaxaca	Natividad	20062	1.8	0.4	10.0	31.9	2.9	2.6	0.7
Oaxaca	Nazareno Etla	20063	30.5	2.6	41.5	113.2	8.0	7.4	3.8
Oaxaca	Nejapa de Madero	20064	40.8	2.5	267.5	1,143.8	157.9	125.0	8.6
Oaxaca	Ixpantepec Nieves	20065	8.9	0.8	43.6	165.4	22.7	17.5	2.1
Oaxaca	Santiago Niltepec	20066	57.6	3.1	134.4	479.5	81.7	57.0	6.0
Oaxaca	Oaxaca de Juárez	20067	1,754.4	805.1	4,921.6	17,471.5	1,014.3	491.5	684.7
Oaxaca	Ocotlán de Morelos	20068	64.8	14.1	404.6	1,027.5	95.1	85.3	516.4
Oaxaca	La Pe	20069	9.5	0.7	46.2	176.7	20.0	17.8	2.3
Oaxaca	Pinotepa de Don Luis	20070	23.8	2.7	191.4	699.5	82.8	76.1	7.1
Oaxaca	Pluma Hidalgo	20071	15.0	1.7	124.5	484.9	63.5	54.7	4.3
Oaxaca	San José del Progreso	20072	20.0	2.3	141.8	542.4	63.0	55.6	6.4
Oaxaca	Putla Villa de Guerrero	20073	140.9	16.9	804.7	3,105.6	362.0	317.9	1,552.2
Oaxaca	Santa Catarina Quioquitani	20074	1.6	0.2	12.4	48.2	7.3	5.4	0.5
Oaxaca	Reforma de Pineda	20075	51.0	1.9	52.0	170.4	20.5	18.1	3.0
Oaxaca	La Reforma	20076	21.4	1.6	99.4	385.6	55.7	43.3	4.0
Oaxaca	Reyes Etla	20077	8.5	1.1	46.9	167.4	15.7	14.4	2.7
Oaxaca	Rojas de Cuauhtémoc	20078	3.0	0.3	12.9	38.3	3.6	2.4	1.2
Oaxaca	Salina Cruz	20079	10,244.3	48,519.6	6,777.9	3,053.7	3,327.9	2,174.4	86.7
Oaxaca	San Agustín Amatengo	20080	6.5	0.7	48.4	174.7	22.8	18.9	2.0
Oaxaca	San Agustín Atenango	20081	21.4	1.5	61.7	228.1	30.6	25.8	2.6
Oaxaca	San Agustín Chayuco	20082	17.2	1.6	134.9	518.9	68.5	57.7	5.2
Oaxaca	San Agustín de las Juntas	20083	36.0	7.6	117.9	378.0	14.0	12.3	6.0
Oaxaca	San Agustín Etla	20084	9.1	1.7	37.2	114.9	9.7	6.9	3.6
Oaxaca	San Agustín Loxicha	20085	85.9	7.5	693.5	2,769.8	323.6	298.1	25.5
Oaxaca	San Agustín Tlacotepec	20086	7.6	0.5	32.7	150.2	19.5	15.9	0.9
Oaxaca	San Agustín Yatareni	20087	20.9	2.6	65.1	263.1	10.6	9.9	4.1
Oaxaca	San Andrés Cabecera Nueva	20088	11.2	0.9	88.5	339.3	49.3	37.4	3.5

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	San Andrés Dinicuiti	20089	7.7	0.8	57.9	221.6	28.9	23.7	2.4
Oaxaca	San Andrés Huaxpaltepec	20090	28.6	2.8	156.2	583.1	70.7	63.4	6.4
Oaxaca	San Andrés Huayapam	20091	23.7	2.1	67.7	291.5	11.9	10.1	4.7
Oaxaca	San Andrés Ixtlahuaca	20092	25.5	0.9	33.4	122.1	16.3	14.0	1.6
Oaxaca	San Andrés lagunas	20093	7.2	0.3	15.5	58.8	9.7	7.0	0.6
Oaxaca	San Andrés Nuxiño	20094	7.5	0.7	57.4	224.5	28.4	24.0	2.3
Oaxaca	San Andrés Paxtlán	20095	13.5	1.1	103.2	398.0	45.9	41.7	4.2
Oaxaca	San Andrés Sinaxtla	20096	7.2	0.6	9.8	29.7	3.7	2.7	0.8
Oaxaca	San Andrés Solaga	20097	6.1	0.7	46.8	178.6	21.7	18.9	1.9
Oaxaca	San Andrés Teotilálpam	20098	17.1	1.6	147.0	589.5	74.4	65.5	4.9
Oaxaca	San Andrés Tepetlapa	20099	1.9	0.2	13.0	49.8	6.3	5.1	0.6
Oaxaca	San Andrés Yaá	20100	1.9	0.2	15.0	57.5	8.8	6.4	0.6
Oaxaca	San Andrés Zabache	20101	3.3	0.4	23.7	90.6	9.8	9.2	1.0
Oaxaca	San Andrés Zautla	20102	14.4	1.4	49.0	155.7	17.5	13.1	3.5
Oaxaca	San Antonino Castillo Velasco	20103	13.7	2.3	60.5	172.0	12.0	9.9	5.5
Oaxaca	San Antonino el Alto	20104	6.9	0.7	51.8	200.9	25.4	21.3	2.2
Oaxaca	San Antonino Monte Verde	20105	22.4	1.9	168.0	658.4	76.1	68.9	7.0
Oaxaca	San Antonio Acutla	20106	3.8	0.1	9.5	36.2	5.1	4.1	0.4
Oaxaca	San Antonio de la Cal	20107	98.8	11.4	277.7	1,245.9	48.0	44.9	18.3
Oaxaca	San Antonio Huitepec	20108	20.9	1.7	120.4	470.8	62.0	51.2	4.9
Oaxaca	San Antonio Nanahuatipam	20109	49.5	1.0	30.4	107.8	19.8	12.9	1.5
Oaxaca	San Antonio Sinicahua	20110	4.9	0.4	36.0	140.7	16.7	14.7	1.5
Oaxaca	San Antonio Tepetlapa	20111	14.7	1.4	118.1	459.1	56.5	50.8	4.3
Oaxaca	San Baltazar Chichicapam	20112	15.7	1.4	79.3	295.1	36.9	31.5	3.3
Oaxaca	San Baltazar Loxicha	20113	11.0	1.4	89.2	341.8	45.3	38.3	3.3
Oaxaca	San Baltazar Yatzachi el Bajo	20114	3.5	0.3	24.3	100.6	12.6	10.5	0.9
Oaxaca	San Bartolo Coyotepec	20115	32.5	4.1	84.8	293.2	14.6	11.4	5.7
Oaxaca	San Bartolomé Ayautla	20116	15.0	1.5	123.1	478.8	57.5	53.0	4.3
Oaxaca	San Bartolomé Loxicha	20117	9.9	1.0	82.5	321.5	44.3	36.7	2.8
Oaxaca	San Bartolomé Quialana	20118	9.2	0.9	59.8	227.2	24.0	22.1	3.1
Oaxaca	San Bartolomé Yucuañe	20119	2.6	0.2	19.4	82.9	13.2	9.3	0.6
Oaxaca	San Bartolomé Zoogochó	20120	2.0	0.3	12.1	44.4	4.8	4.1	0.7
Oaxaca	San Bartolo Soyaltepec	20121	16.1	0.5	24.6	94.5	15.4	11.7	0.9
Oaxaca	San Bartolo Yautepec	20122	3.0	0.3	25.2	96.4	15.1	11.3	0.9
Oaxaca	San Bernardo Mixtepec	20123	9.7	1.2	70.7	269.8	34.1	28.3	3.1
Oaxaca	San Blas Atempa	20124	58.9	6.8	464.0	1,572.7	183.4	167.1	18.0
Oaxaca	San Carlos Yautepec	20125	43.0	3.3	390.7	1,373.2	262.7	165.9	4,719.8
Oaxaca	San Cristóbal Amatlán	20126	16.0	1.6	134.7	464.4	56.7	49.4	4.8

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	San Cristóbal Amoltepec	20127	4.3	0.4	32.3	126.2	14.7	13.3	1.3
Oaxaca	San Cristóbal Lachirioag	20128	4.6	0.7	33.8	122.5	14.3	13.0	1.4
Oaxaca	San Cristóbal Suchixtlahuaca	20129	22.2	1.0	12.0	43.8	8.6	6.7	0.4
Oaxaca	San Dionisio del Mar	20130	64.3	2.2	134.1	482.9	66.3	53.6	5.6
Oaxaca	San Dionisio Ocotepec	20131	42.9	5.3	261.4	964.5	120.4	101.3	11.1
Oaxaca	San Dionisio Ocotlán	20132	13.5	0.6	15.7	53.9	5.9	5.1	1.2
Oaxaca	San Esteban Atlatlahuca	20133	12.4	1.1	94.5	368.1	45.8	39.2	3.9
Oaxaca	San Felipe Jalapa de Díaz	20134	93.1	10.2	778.5	3,045.1	357.6	337.9	26.3
Oaxaca	San Felipe Tejalapam	20135	29.6	2.4	158.3	581.8	66.8	59.8	7.0
Oaxaca	San Felipe Usila	20136	52.1	5.5	401.5	1,565.3	203.3	177.9	13.2
Oaxaca	San Francisco Cahuacúa	20137	16.5	1.1	122.1	531.2	73.4	57.9	3.8
Oaxaca	San Francisco Cajonos	20138	1.7	0.3	12.4	44.7	7.0	4.9	0.5
Oaxaca	San Francisco Chapulapa	20139	6.9	0.6	52.2	205.3	25.3	21.8	2.2
Oaxaca	San Francisco Chindúa	20140	10.5	0.6	18.8	68.7	8.9	7.6	0.9
Oaxaca	San Francisco del Mar	20141	72.6	3.3	155.5	570.1	98.3	69.5	6.6
Oaxaca	San Francisco Huehuetlán	20142	5.0	0.5	36.2	140.8	15.8	14.5	1.6
Oaxaca	San Francisco Ixhuatán	20143	106.1	6.0	203.9	712.5	86.2	74.6	10.6
Oaxaca	San Francisco Jaltepetongo	20144	11.8	0.4	27.5	101.6	14.0	11.0	1.3
Oaxaca	San Francisco Lachigoló	20145	5.4	0.8	27.5	82.9	7.0	6.1	2.0
Oaxaca	San Francisco Logueche	20146	6.9	0.6	54.5	214.7	26.5	23.1	2.1
Oaxaca	San Francisco Nuxaño	20147	1.4	0.3	9.6	35.7	4.9	3.7	0.5
Oaxaca	San Francisco Ozolotepec	20148	7.2	0.7	54.7	214.9	25.1	22.6	2.3
Oaxaca	San Francisco Sola	20149	5.0	0.5	35.6	142.9	21.1	15.5	1.4
Oaxaca	San Francisco Telixtlahuaca	20150	159.0	5.6	661.3	3,466.3	399.4	349.5	11.0
Oaxaca	San Francisco Teopan	20151	1.7	0.2	14.1	54.4	10.8	6.6	0.5
Oaxaca	San Francisco Tlapancingo	20152	7.5	0.9	57.3	222.5	30.5	24.8	2.3
Oaxaca	San Gabriel Mixtepec	20153	120.1	2.6	751.0	4,133.6	495.1	433.4	4.5
Oaxaca	San Ildefonso Amatlán	20154	7.1	0.7	53.9	211.1	27.2	22.7	2.2
Oaxaca	San Ildefonso Sola	20155	3.1	0.3	24.3	96.1	13.1	10.5	1.0
Oaxaca	San Ildefonso Villa Alta	20156	11.5	1.5	87.2	288.8	36.7	30.5	176.0
Oaxaca	San Jacinto Amilpas	20157	53.9	6.5	129.4	570.3	10.2	9.3	10.0
Oaxaca	San Jacinto Tlacotepec	20158	8.6	0.8	65.3	249.7	31.5	27.3	2.7
Oaxaca	San Jerónimo Coatlán	20159	47.6	1.6	309.5	1,513.5	203.2	163.4	5.9
Oaxaca	San Jerónimo Silacayoapilla	20160	6.6	0.9	45.9	172.9	21.2	17.7	2.1
Oaxaca	San Jerónimo Sosola	20161	43.9	1.2	82.5	319.9	48.9	36.4	3.1
Oaxaca	San Jerónimo Taviche	20162	13.4	0.9	44.0	171.0	23.0	19.1	1.7
Oaxaca	San Jerónimo Tecatl	20163	6.1	0.9	45.1	169.9	19.1	17.5	1.9
Oaxaca	San Jorge Nuchita	20164	25.1	1.6	88.3	332.0	40.7	36.5	3.8

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	San José Ayuquila	20165	4.5	0.5	32.5	120.7	14.7	12.5	1.4
Oaxaca	San José Chiltepec	20166	76.7	4.6	306.9	1,139.0	141.9	128.2	11.2
Oaxaca	San José del Peñasco	20167	6.9	0.6	52.0	202.5	23.2	21.2	2.1
Oaxaca	San José Estancia Grande	20168	6.1	0.5	28.7	110.2	16.1	12.8	1.0
Oaxaca	San José Independencia	20169	18.8	2.0	163.3	642.7	77.7	72.4	5.1
Oaxaca	San José Iachiguirí	20170	11.7	1.3	91.5	357.9	41.9	38.0	3.6
Oaxaca	San José Tenango	20171	79.7	7.3	665.3	2,609.4	311.7	290.4	22.6
Oaxaca	San Juan Achiutla	20172	7.1	0.3	14.0	50.7	7.9	5.9	0.6
Oaxaca	San Juan Atepéc	20173	6.0	0.8	47.2	179.0	22.7	19.2	1.8
Oaxaca	Animas Trujano	20174	18.3	2.7	44.2	206.3	5.6	4.9	3.5
Oaxaca	San Juan Bautista Atlatlahuca	20175	11.9	0.8	61.4	236.5	53.0	31.0	2.0
Oaxaca	San Juan Bautista Coixtlahuaca	20176	37.7	2.0	105.2	339.0	58.0	40.2	1,152.5
Oaxaca	San Juan Bautista Cuicatlán	20177	97.6	6.1	267.1	887.1	126.1	98.1	1,341.0
Oaxaca	San Juan Bautista Guelache	20178	10.6	0.8	58.1	196.4	19.8	16.5	4.0
Oaxaca	San Juan Bautista Jayacatlán	20179	7.3	0.7	39.2	142.5	23.8	16.9	1.4
Oaxaca	San Juan Bautista Lo de Soto	20180	60.6	2.0	65.9	243.8	35.7	30.9	2.6
Oaxaca	San Juan Bautista Suchitepec	20181	1.6	0.2	14.1	53.5	11.7	6.7	0.5
	San Juan Bautista								
Oaxaca	Tlacoatzintepéc	20182	9.2	0.8	79.9	315.2	39.3	35.7	2.5
Oaxaca	San Juan Bautista Tlachichilco	20183	8.4	0.6	47.4	183.2	26.0	21.1	1.7
Oaxaca	San Juan Bautista Tuxtepec	20184	997.3	1,545.1	2,670.2	7,425.0	902.0	757.8	8,139.6
Oaxaca	San Juan Cacahuatepec	20185	27.2	4.2	197.1	732.2	90.9	78.5	8.5
Oaxaca	San Juan Cieneguilla	20186	5.1	0.4	20.8	77.1	16.1	9.8	0.8
Oaxaca	San Juan Coatzospam	20187	10.0	0.9	77.1	313.6	38.8	33.7	2.8
Oaxaca	San Juan Colorado	20188	35.3	3.5	279.3	1,102.9	132.1	121.0	9.8
Oaxaca	San Juan Comaltepec	20189	8.5	0.8	64.7	248.0	33.7	27.5	2.7
Oaxaca	San Juan Cotzocón	20190	158.8	10.0	618.5	2,335.4	346.3	268.6	24.6
Oaxaca	San Juan Chicomezúchil	20191	1.4	0.6	10.7	37.0	5.1	4.0	0.4
Oaxaca	San Juan Chilateca	20192	6.4	0.6	17.5	50.7	3.6	3.3	1.5
Oaxaca	San Juan del Estado	20193	15.2	1.2	47.1	168.5	24.2	17.5	2.6
Oaxaca	San Juan del Río	20194	4.7	0.8	33.6	112.0	15.7	12.0	1.5
Oaxaca	San Juan Diuxi	20195	5.6	0.6	42.5	167.5	21.7	17.9	1.7
Oaxaca	San Juan Evangelista Analco	20196	1.5	0.2	11.3	41.7	5.2	4.4	0.5
Oaxaca	San Juan Guelavía	20197	36.1	1.7	57.2	203.0	21.2	18.9	3.3
Oaxaca	San Juan Guichicovi	20198	159.9	10.4	880.6	3,409.2	430.2	381.3	31.1
Oaxaca	San Juan Ihualtepec	20199	3.0	0.3	22.5	87.3	12.4	9.5	1.0
Oaxaca	San Juan Juquila Mixes	20200	13.4	1.6	130.5	421.7	65.4	47.7	554.2
Oaxaca	San Juan Juquila Vijanos	20201	6.7	0.8	50.8	195.7	22.7	20.5	2.1

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	San Juan Lachao	20202	15.6	1.4	121.5	449.3	62.4	49.9	4.9
Oaxaca	San Juan Lachigalla	20203	11.5	0.9	87.1	342.4	42.7	36.4	3.6
Oaxaca	San Juan Lajarcia	20204	2.5	0.2	21.9	82.2	15.9	10.1	0.8
Oaxaca	San Juan Lalana	20205	71.1	5.4	552.3	2,163.5	288.3	245.8	19.0
Oaxaca	San Juan de los Cues	20206	19.0	1.0	61.0	224.4	30.5	24.9	2.8
Oaxaca	San Juan Mazatlán	20207	126.5	5.9	721.9	3,118.2	456.8	356.5	19.4
Oaxaca	San Juan Mixtepec - Distr. 08	20208	33.5	3.8	246.7	982.5	124.7	104.1	10.8
Oaxaca	San Juan Mixtepec - Distr. 26	20209	4.1	0.4	34.0	103.6	15.9	11.6	1.1
Oaxaca	San Juan Ñumí	20210	33.0	2.1	205.3	845.7	104.8	90.1	7.7
Oaxaca	San Juan Ozolotepec	20211	13.7	1.1	104.9	432.9	64.3	48.1	3.5
Oaxaca	San Juan Petlapa	20212	10.1	0.8	88.0	345.3	51.1	40.3	2.9
Oaxaca	San Juan Quiahije	20213	13.9	1.3	105.8	417.1	56.7	45.2	4.4
Oaxaca	San Juan Quiotepec	20214	8.9	1.0	69.2	267.7	41.2	29.8	2.8
Oaxaca	San Juan Sayultepec	20215	30.9	0.6	15.7	57.1	9.0	8.0	0.8
Oaxaca	San Juan Tabaá	20216	4.2	0.4	31.5	118.6	14.2	12.8	1.3
Oaxaca	San Juan Tamazola	20217	20.6	1.1	101.0	398.8	64.0	45.7	3.9
Oaxaca	San Juan Teita	20218	2.1	0.2	18.3	66.4	14.2	8.4	0.6
Oaxaca	San Juan Teitipac	20219	22.7	1.1	66.2	244.6	28.4	25.4	3.2
Oaxaca	San Juan Tepeuxila	20220	11.0	1.0	88.4	344.3	51.2	38.6	3.4
Oaxaca	San Juan Teposcolula	20221	10.4	0.6	44.3	146.1	21.9	16.3	350.1
Oaxaca	San Juan Yaeé	20222	6.5	0.8	56.5	215.5	26.3	23.7	1.8
Oaxaca	San Juan Yatzona	20223	1.8	0.2	13.9	53.0	7.0	5.9	0.6
Oaxaca	San Juan Yucuita	20224	33.8	0.7	19.0	65.3	10.5	9.2	0.8
Oaxaca	San Lorenzo	20225	25.6	1.9	199.4	829.1	98.5	90.6	6.1
Oaxaca	San Lorenzo Albarradas	20226	9.2	1.1	69.9	265.2	37.7	28.8	2.9
Oaxaca	San Lorenzo Cacaotepec	20227	58.7	5.4	149.7	599.5	26.9	24.3	11.9
Oaxaca	San Lorenzo Cuaunecuitlita	20228	2.7	0.3	20.1	79.2	9.1	8.3	0.8
Oaxaca	San Lorenzo Texmelucan	20229	20.8	1.6	155.7	601.8	74.7	65.4	6.4
Oaxaca	San Lorenzo Victoria	20230	14.8	0.7	33.8	126.0	17.8	14.7	1.4
Oaxaca	San Lucas Camotlán	20231	11.5	1.0	87.0	332.8	42.8	36.5	3.6
Oaxaca	San Lucas Ojitlán	20232	87.5	9.7	735.8	2,813.7	363.3	320.7	22.8
Oaxaca	San Lucas Quiaviní	20233	46.1	1.4	54.2	209.7	28.7	25.3	2.2
Oaxaca	San Lucas Zoquiapam	20234	26.3	2.1	196.8	772.7	86.4	80.5	8.2
Oaxaca	San Luis Amatlán	20235	13.6	1.1	113.2	437.7	64.5	49.3	4.1
Oaxaca	San Marcial Ozolotepec	20236	6.3	0.7	47.6	186.8	22.0	19.7	2.0
Oaxaca	San Marcos Arteaga	20237	12.4	1.1	42.9	150.5	20.3	14.7	2.6
Oaxaca	San Martín de los Cansecos	20238	2.7	0.2	19.9	77.0	8.7	8.0	0.9
Oaxaca	San Martín Huamelulpam	20239	3.9	0.4	28.6	109.9	14.4	11.7	1.2

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	San Martín Itunyoso	20240	9.6	0.8	71.6	282.3	34.6	29.9	3.0
Oaxaca	San Martín Lachilá	20241	4.2	0.6	29.9	109.7	12.1	11.0	1.4
Oaxaca	San Martín Peras	20242	38.6	3.4	281.4	1,184.5	143.3	125.1	10.1
Oaxaca	San Martín Tilcajete	20243	14.6	1.0	54.1	150.6	16.5	14.9	2.0
Oaxaca	San Martín Toxpanal	20244	14.6	1.3	86.5	324.3	38.8	34.6	3.7
Oaxaca	San Martín Zácatepec	20245	7.6	0.7	37.8	147.1	19.0	15.9	1.6
Oaxaca	San Mateo Cajonos	20246	5.0	0.3	19.5	62.5	7.8	6.9	0.7
Oaxaca	Capulalpam de Méndez	20247	4.3	1.2	23.6	71.9	11.0	6.5	1.6
Oaxaca	San Mateo del Mar	20248	45.3	4.1	258.5	968.4	110.3	101.4	12.1
Oaxaca	San Mateo Yoloxochitlán	20249	9.8	1.6	64.2	229.0	23.2	21.8	3.3
Oaxaca	San Mateo Etlatongo	20250	27.3	0.8	27.4	101.5	13.7	12.2	1.3
Oaxaca	San Mateo Nejapam	20251	4.3	0.5	34.3	130.0	18.0	14.6	1.3
Oaxaca	San Mateo Peñasco	20252	6.7	0.7	49.6	189.5	21.7	19.7	2.1
Oaxaca	San Mateo Piñas	20253	15.7	1.4	124.3	478.4	63.8	53.5	4.7
Oaxaca	San Mateo Río Hondo	20254	29.5	1.1	199.9	966.4	123.3	102.6	4.0
Oaxaca	San Mateo Sindhui	20255	7.1	0.8	55.2	215.0	31.5	23.8	2.2
Oaxaca	San Mateo Tlapiltepec	20256	3.5	0.2	7.4	28.0	4.3	3.3	0.3
Oaxaca	San Melchor Betaza	20257	4.1	0.4	31.3	117.6	14.9	12.8	1.3
Oaxaca	San Miguel Achiutla	20258	5.8	0.6	26.5	99.2	17.2	11.7	1.0
Oaxaca	San Miguel Ahuehuetlán	20259	8.4	1.0	64.7	246.5	32.9	27.3	2.6
Oaxaca	San Miguel Aloápam	20260	9.5	1.3	72.6	275.0	37.3	29.7	3.0
Oaxaca	San Miguel Amatatlán	20261	22.5	2.2	172.7	680.2	84.6	72.8	7.0
Oaxaca	San Miguel Amatlán	20262	3.9	0.5	29.5	112.1	16.1	12.2	1.2
Oaxaca	San Miguel Coatlán	20263	11.9	1.1	90.5	360.1	45.7	38.5	3.6
Oaxaca	San Miguel Chicahua	20264	8.2	0.7	62.1	242.4	29.0	25.5	2.6
Oaxaca	San Miguel Chimalapa	20265	40.4	1.9	296.8	1,355.7	211.1	154.0	6.7
Oaxaca	San Miguel del Puerto	20266	42.5	2.8	325.6	1,378.3	187.1	153.6	9.7
Oaxaca	San Miguel del Río	20267	1.0	0.1	6.9	20.3	3.1	2.0	0.3
Oaxaca	San Miguel Ejutla	20268	8.2	0.4	20.2	76.2	8.3	7.9	1.0
Oaxaca	San Miguel el Grande	20269	13.1	1.6	97.0	370.8	45.4	38.9	4.1
Oaxaca	San Miguel Huautla	20270	6.2	0.6	47.5	183.4	23.1	19.6	1.9
Oaxaca	San Miguel Mixtepec	20271	7.6	0.7	58.1	227.8	28.5	24.3	2.4
Oaxaca	San Miguel Panixtlahuaca	20272	39.2	2.5	276.2	1,239.4	147.0	132.3	7.6
Oaxaca	San Miguel Peras	20273	12.3	1.1	91.6	367.4	45.6	39.0	3.6
Oaxaca	San Miguel Piedras	20274	4.3	0.4	33.4	130.0	18.6	14.3	1.4
Oaxaca	San Miguel Quetzaltepec	20275	19.7	2.5	150.7	568.7	74.2	62.6	6.0
Oaxaca	San Miguel Santa Flor	20276	3.2	0.4	23.9	93.3	11.3	9.9	1.0
Oaxaca	Villa Sola de Vega	20277	56.5	5.1	490.0	1,748.5	260.9	192.3	4,927.2

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Oaxaca	San Miguel Soyaltepec	20278	234.4	15.7	1,196.3	4,667.1	580.0	528.6	40.8
Oaxaca	San Miguel Suchixtepec	20279	58.3	1.1	373.3	1,983.8	232.4	206.3	3.0
Oaxaca	Villa Talea de Castro	20280	9.3	1.7	65.6	237.6	27.9	24.0	3.0
Oaxaca	San Miguel Tecomatlán	20281	3.5	0.1	6.2	22.8	3.6	2.6	0.3
Oaxaca	San Miguel Tenango	20282	3.1	0.3	33.0	126.4	37.3	17.9	0.9
Oaxaca	San Miguel Tequixtepec	20283	11.5	0.5	31.6	119.6	25.5	15.2	1.2
Oaxaca	San Miguel Tilquiapam	20284	11.4	1.2	86.8	336.7	40.2	35.5	3.6
Oaxaca	San Miguel Tlacamama	20285	13.2	1.5	97.9	390.9	49.3	42.5	3.5
Oaxaca	San Miguel Tlacotepec	20286	12.2	1.6	84.4	321.0	36.9	32.5	4.0
Oaxaca	San Miguel Tulancingo	20287	9.4	0.3	14.0	53.5	9.5	6.8	0.5
Oaxaca	San Miguel Yotao	20288	2.2	0.4	17.3	67.1	9.6	7.4	0.7
Oaxaca	San Nicolás	20289	4.1	0.4	30.4	118.2	13.9	12.4	1.3
Oaxaca	San Nicolás Hidalgo	20290	3.2	0.6	19.0	66.2	7.2	6.4	1.1
Oaxaca	San Pablo Coatlán	20291	238.9	1.2	1,458.8	8,292.4	976.1	862.6	4.6
Oaxaca	San Pablo Cuatro Venados	20292	29.4	0.6	50.9	204.2	54.3	27.7	1.5
Oaxaca	San Pablo Etla	20293	40.1	3.9	100.8	363.5	20.7	16.3	312.0
Oaxaca	San Pablo Huitzo	20294	40.8	3.6	71.4	225.7	23.9	18.0	5.7
Oaxaca	San Pablo Huixtepec	20295	26.7	5.2	142.6	480.9	42.1	39.2	9.6
Oaxaca	San Pablo Macuiltianguis	20296	4.1	0.8	33.1	117.2	18.9	13.1	1.3
Oaxaca	San Pablo Tijaltepec	20297	9.1	0.8	70.4	276.4	36.0	29.9	2.8
Oaxaca	San Pablo Villa de Mitla	20298	32.6	6.4	196.7	605.9	66.5	52.6	11.9
Oaxaca	San Pablo Yaganiza	20299	11.4	0.6	85.0	355.3	42.4	37.0	1.2
Oaxaca	San Pedro Amuzgos	20300	19.1	2.6	138.2	509.6	62.0	54.3	6.0
Oaxaca	San Pedro Apóstol	20301	28.5	1.6	33.7	112.7	13.5	12.6	1.7
Oaxaca	San Pedro Atoyac	20302	14.7	1.5	122.2	462.1	56.9	51.3	4.3
Oaxaca	San Pedro Cajonos	20303	4.1	0.7	28.6	90.7	9.1	8.5	1.4
Oaxaca	San Pedro Coxcaltepec Cántaros	20304	3.9	0.4	31.3	120.2	18.8	13.6	1.2
Oaxaca	San Pedro Comitancillo	20305	41.7	2.0	68.5	219.9	24.8	21.2	4.1
Oaxaca	San Pedro el Alto	20306	17.1	1.5	128.8	509.3	60.4	53.7	5.4
Oaxaca	San Pedro Huamelula	20307	47.6	3.7	301.9	1,151.2	177.6	133.7	11.2
Oaxaca	San Pedro Huilotepec	20308	19.6	1.3	64.7	241.6	28.1	26.1	2.9
Oaxaca	San Pedro Ixcatlán	20309	44.2	4.9	378.1	1,474.8	177.3	165.1	12.3
Oaxaca	San Pedro Ixtlahuaca	20310	13.9	1.1	62.8	225.5	21.4	19.8	4.1
Oaxaca	San Pedro Jaltepetongo	20311	31.6	0.6	27.4	92.0	14.4	10.9	0.8
Oaxaca	San Pedro Jicayán	20312	37.8	3.9	304.2	1,179.9	139.1	129.6	11.1
Oaxaca	San Pedro Jocotipac	20313	4.1	0.6	40.1	122.8	17.8	13.8	1.1
Oaxaca	San Pedro Juchatengo	20314	5.6	1.2	40.8	146.0	19.3	15.8	1.8
Oaxaca	San Pedro Martír	20315	22.1	1.0	44.4	165.3	18.7	17.5	2.2

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	San Pedro Mártir Quiechapa	20316	3.1	0.4	27.2	104.6	18.9	12.5	0.9
Oaxaca	San Pedro Mártir Yucuxaco	20317	5.6	0.5	42.8	166.2	22.5	18.0	1.8
Oaxaca	San Pedro Mixtepec - Distr. 22	20318	291.1	43.7	680.7	2,015.0	223.7	199.2	36.8
Oaxaca	San Pedro Mixtepec - Distr. 26	20319	4.6	0.7	39.2	144.4	25.1	16.8	1.4
Oaxaca	San Pedro Molinos	20320	2.4	0.3	18.0	67.2	8.6	7.1	0.7
Oaxaca	San Pedro Nopala	20321	3.4	0.6	27.2	105.1	17.5	12.1	1.0
Oaxaca	San Pedro Ocopatillo	20322	3.2	0.3	23.8	92.6	10.4	9.6	1.0
Oaxaca	San Pedro Ocotepec	20323	6.5	0.6	49.0	190.1	23.3	20.1	2.0
Oaxaca	San Pedro Pochutla	20324	136.1	23.5	943.7	3,270.3	379.8	339.3	2,182.8
Oaxaca	San Pedro Quiatoni	20325	37.0	3.4	292.5	1,154.5	160.2	127.8	10.8
Oaxaca	San Pedro Sochiapam	20326	18.1	1.8	153.4	602.6	79.4	68.5	5.1
Oaxaca	San Pedro Tapanatepec	20327	242.1	8.9	290.8	1,012.5	156.7	116.3	15.2
Oaxaca	San Pedro Taviche	20328	4.0	0.4	34.4	120.1	18.2	13.5	1.2
Oaxaca	San Pedro Teozacoalco	20329	5.3	0.6	42.2	160.4	23.4	17.8	1.6
Oaxaca	San Pedro Teutila	20330	16.6	1.5	141.1	553.1	73.1	62.9	4.7
Oaxaca	San Pedro Tidaá	20331	5.7	0.6	24.7	92.1	13.2	10.3	1.0
Oaxaca	San Pedro Topiltepec	20332	6.7	0.3	12.3	45.4	7.8	5.5	0.5
Oaxaca	San Pedro Totolapa	20333	9.3	1.6	69.7	251.4	50.3	30.1	3.0
H-36	Villa de Tututepec de Melchor Oca	20334	471.8	27.8	1,170.7	4,197.1	555.1	477.8	48.3
	San Pedro Yaneri	20335	3.6	0.3	27.3	103.8	12.8	11.3	1.1
	San Pedro Yólox	20336	9.4	1.0	74.3	291.0	37.9	31.6	2.9
	San Pedro y San Pablo Ayutla	20337	19.6	3.2	141.3	529.8	61.2	54.3	6.2
	Villa de Etila	20338	32.5	8.7	127.6	248.2	13.1	11.9	8.9
	San Pedro y San Pablo Teposcolula	20339	47.9	64.8	91.5	319.4	57.3	42.9	4.0
	San Pedro y San Pablo Tequixtepec	20340	12.3	0.8	52.2	196.2	32.3	22.1	2.3
	San Pedro Yucunama	20341	0.8	0.1	5.9	21.1	4.1	2.4	0.3
	San Raymundo Jalpan	20342	5.0	0.7	28.2	101.5	9.5	8.9	1.8
	San Sebastián Abasolo	20343	5.9	0.7	26.2	88.8	7.8	6.3	2.3
	San Sebastián Coatlán	20344	8.7	0.9	69.6	272.1	39.4	30.3	2.7
	San Sebastián Ixcapa	20345	14.0	1.7	107.5	409.9	51.2	44.9	4.2
	San Sebastián Nicananduta	20346	5.7	0.8	40.5	151.8	18.2	15.6	1.9
	San Sebastián Río Hondo	20347	13.2	1.2	108.2	394.8	48.4	41.9	3.7
	San Sebastián Tecomaxtlahuaca	20348	43.2	3.9	221.6	809.7	99.1	84.3	9.8
	San Sebastián Teitipac	20349	12.2	0.8	47.3	167.2	18.9	16.7	2.3
	San Sebastián Tutla	20350	54.4	7.5	167.3	561.4	16.5	15.3	18.8

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Oaxaca	San Simón Almolongas	20351	8.5	0.8	58.5	224.1	25.9	22.7	2.8
Oaxaca	San Simón Zahuatlán	20352	8.0	0.8	60.1	237.5	26.2	24.7	2.5
Oaxaca	Santa Ana	20353	9.3	0.8	49.5	190.6	23.3	20.2	2.1
Oaxaca	Santa Ana Ateixtlahuaca	20354	1.9	0.2	14.9	58.0	7.5	6.3	0.6
Oaxaca	Santa Ana Cuauhtémoc	20355	3.2	0.4	24.8	96.8	12.7	10.5	1.0
Oaxaca	Santa Ana del Valle	20356	15.1	1.2	48.6	175.9	20.1	17.8	2.4
Oaxaca	Santa Ana Tavela	20357	3.8	0.5	31.8	118.1	19.8	14.0	1.1
Oaxaca	Santa Ana Tlapacoyan	20358	6.7	0.8	44.5	163.4	19.9	16.3	2.3
Oaxaca	Santa Ana Yarení	20359	4.1	0.6	30.5	117.0	14.9	12.4	1.3
Oaxaca	Santa Ana Zegache	20360	11.9	1.4	83.1	318.5	34.4	32.0	3.9
Oaxaca	Santa Catalina Quieri	20361	3.6	0.5	28.0	109.1	16.1	12.1	1.1
Oaxaca	Santa Catarina Cuixtla	20362	5.3	0.8	36.8	134.8	15.2	13.4	1.8
Oaxaca	Santa Catarina Ixtepeji	20363	9.2	0.9	67.9	261.5	40.0	28.7	2.9
Oaxaca	Santa Catarina Juquila	20364	50.9	9.2	408.7	1,463.2	210.8	158.6	3,789.3
Oaxaca	Santa Catarina Lachatao	20365	5.6	0.5	42.8	165.9	23.6	18.1	1.7
Oaxaca	Santa Catarina Loxicha	20366	31.4	1.6	220.1	1,024.3	124.7	109.8	5.0
Oaxaca	Santa Catarina Mechoacán	20367	18.8	1.7	129.5	492.0	58.6	54.0	4.8
Oaxaca	Santa Catarina Minas	20368	5.5	0.6	38.6	140.3	16.9	14.2	1.8
Oaxaca	Santa Catarina Quiané	20369	5.3	0.6	26.7	96.2	9.2	7.9	2.0
Oaxaca	Santa Catarina Tayata	20370	13.1	0.4	20.8	79.9	11.4	9.5	0.8
Oaxaca	Santa Catarina Ticuá	20371	5.7	0.4	22.4	83.6	9.8	8.8	1.0
Oaxaca	Santa Catarina Yosonotú	20372	6.8	0.8	51.4	199.7	23.8	21.1	2.1
Oaxaca	Santa Catarina Zapotilla	20373	2.1	0.2	18.0	68.1	14.2	8.4	0.6
Oaxaca	Santa Cruz Acatepec	20374	4.6	0.5	34.8	134.9	15.2	14.1	1.4
Oaxaca	Santa Cruz Amilpas	20375	40.7	4.0	92.3	408.4	8.1	7.4	7.7
Oaxaca	Santa Cruz de Bravo	20376	1.5	0.3	10.7	40.2	5.1	4.2	0.5
Oaxaca	Santa Cruz Itundujía	20377	48.6	3.4	363.0	1,515.4	198.8	163.1	12.1
Oaxaca	Santa Cruz Mixtepec	20378	29.7	1.4	79.4	302.9	35.3	32.0	3.8
Oaxaca	Santa Cruz Nundaco	20379	9.7	0.9	72.7	286.0	33.7	30.0	3.0
Oaxaca	Santa Cruz Papalutla	20380	5.9	0.7	34.9	123.2	12.4	11.1	2.1
Oaxaca	Santa Cruz Tacache de Mina	20381	16.6	1.9	54.7	184.1	20.5	18.5	3.0
Oaxaca	Santa Cruz Tacahua	20382	4.3	0.5	33.6	129.6	15.9	13.9	1.3
Oaxaca	Santa Cruz Tayata	20383	2.1	0.2	15.6	60.9	7.6	6.5	0.6
Oaxaca	Santa Cruz Xitla	20384	14.4	1.3	109.8	373.5	42.3	37.8	4.6
Oaxaca	Santa Cruz Xoxocotlán	20385	350.0	38.9	836.4	3,443.8	78.4	71.1	63.3
Oaxaca	Santa Cruz Zenzontepéc	20386	55.8	4.5	428.7	1,656.4	213.1	182.6	17.1
Oaxaca	Santa Gertrudis	20387	40.2	2.2	69.1	251.7	27.8	25.5	4.0
Oaxaca	Santa Inés del Monte	20388	8.3	0.8	62.5	249.1	29.1	26.2	2.5

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Oaxaca	Santa Inés Yatzeche	20389	4.0	0.4	26.2	100.4	10.3	9.8	1.3
Oaxaca	Santa Lucía del Camino	20390	282.9	48.6	677.3	2,805.7	44.0	39.9	53.1
Oaxaca	Santa Lucía Miahuatlán	20391	24.8	1.0	165.2	815.2	97.9	85.5	3.2
Oaxaca	Santa Lucía Monteverde	20392	24.1	2.0	181.6	710.6	86.9	75.2	7.6
Oaxaca	Santa Lucía Ocotlán	20393	11.5	1.6	285.3	279.3	28.5	26.8	3.9
Oaxaca	Santa María Alotepec	20394	9.6	1.0	71.1	274.6	34.3	29.0	3.0
Oaxaca	Santa María Apazco	20395	9.3	0.9	70.7	277.0	34.6	29.6	2.9
Oaxaca	Santa María la Asunción	20396	12.1	1.1	89.8	352.4	38.4	36.5	3.8
Oaxaca	Heroica Ciudad de Tlaxiaco	20397	125.5	22.1	563.4	1,928.8	203.5	176.6	1,368.6
Oaxaca	Ayoquezco de Aldama	20398	18.3	3.0	112.5	408.8	44.6	38.6	6.3
Oaxaca	Santa María Atzompa	20399	95.5	10.0	306.0	1,159.4	43.5	40.0	18.9
Oaxaca	Santa María Camotlán	20400	5.2	0.7	33.1	121.2	15.4	12.0	1.8
Oaxaca	Santa María Colotepec	20401	193.2	11.3	431.4	1,579.7	202.2	175.6	20.5
Oaxaca	Santa María Cortijo	20402	58.9	1.3	40.0	152.9	28.1	22.6	1.2
Oaxaca	Santa María Coyotepec	20403	15.5	1.3	30.3	126.3	5.3	4.7	2.0
Oaxaca	Santa María Chachoapam	20404	81.2	1.3	28.2	105.9	22.1	18.3	0.9
Oaxaca	Villa de Chilapa de Díaz	20405	5.7	0.8	41.5	134.7	23.3	14.5	1.9
Oaxaca	Santa María Chilchotla	20406	83.3	7.9	687.4	2,741.7	326.2	297.9	24.3
Oaxaca	Santa María Chimalapa	20407	28.8	2.6	330.3	1,279.1	383.8	187.0	8.1
Oaxaca	Santa María del Rosario	20408	2.7	0.2	18.2	84.4	10.7	8.9	0.5
Oaxaca	Santa María del Tule	20409	51.6	7.1	133.0	486.6	13.0	10.0	8.7
Oaxaca	Santa María Ecatepec	20410	12.3	1.1	103.6	403.0	77.3	48.4	3.8
Oaxaca	Santa María Guelacé	20411	2.3	0.3	10.9	37.2	3.1	2.8	0.9
Oaxaca	Santa María Guienagati	20412	11.6	1.3	98.8	371.9	61.1	43.9	3.4
Oaxaca	Santa María Huatulco	20413	135.7	52.1	665.4	1,805.8	205.4	171.8	32.1
Oaxaca	Santa María Huazolotitlán	20414	152.0	6.1	289.4	1,070.1	142.0	125.5	11.5
Oaxaca	Santa María Ipalapa	20415	23.2	1.7	135.7	518.1	66.6	57.1	5.6
Oaxaca	Santa María Ixcatlán	20416	14.2	0.5	26.8	85.1	20.8	11.3	0.7
Oaxaca	Santa María Jacatepec	20417	63.0	3.8	341.9	1,345.0	178.0	155.1	11.1
Oaxaca	Santa María Jalapa del Marqués	20418	56.2	5.2	235.5	839.1	127.1	91.9	11.9
Oaxaca	Santa María Jaltianguis	20419	2.2	0.3	16.6	62.2	9.8	6.9	0.7
Oaxaca	Santa María Iachixío	20420	5.3	0.6	40.8	167.5	21.7	18.0	1.2
Oaxaca	Santa María Mixtequilla	20421	33.9	1.9	78.8	274.0	38.4	29.3	4.6
Oaxaca	Santa María Natívitas	20422	2.8	0.4	21.2	80.7	11.2	8.7	0.9
Oaxaca	Santa María Nduayaco	20423	4.8	0.3	17.8	68.3	11.5	8.0	0.7
Oaxaca	Santa María Ozolotepec	20424	15.1	1.4	116.4	454.4	58.1	48.8	4.7
Oaxaca	Santa María Pápalo	20425	7.7	1.0	59.9	234.2	30.6	25.4	2.4
Oaxaca	Santa María Peñoles	20426	25.1	2.2	192.8	758.9	97.3	81.6	7.8

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Oaxaca	Santa María Petapa	20427	59.2	5.5	292.0	1,056.5	118.4	106.1	15.5
Oaxaca	Santa María Quiegolani	20428	5.4	0.5	42.7	166.5	26.2	18.8	1.7
Oaxaca	Santa María Sola	20429	6.0	0.8	44.9	171.3	21.3	18.1	1.9
Oaxaca	Santa María Tataltepec	20430	3.6	0.3	8.6	31.8	6.6	4.1	0.3
Oaxaca	Santa María Tecomavaca	20431	72.4	1.5	52.8	191.6	45.0	26.0	2.1
Oaxaca	Santa María Temaxcalapa	20432	3.5	0.4	26.3	98.3	11.4	10.5	1.1
Oaxaca	Santa María Temaxcaltepec	20433	8.4	0.7	65.0	252.5	29.9	27.5	2.5
Oaxaca	Santa María Teopoxco	20434	17.6	1.5	131.3	517.5	57.4	53.8	5.5
Oaxaca	Santa María Tepantlali	20435	10.0	1.0	76.8	295.3	38.2	31.7	3.1
Oaxaca	Santa María Texcatitlán	20436	5.2	0.6	55.0	153.0	19.5	16.8	1.4
Oaxaca	Santa María Tlahuitoltepec	20437	32.3	3.6	235.7	933.9	106.7	96.8	9.5
Oaxaca	Santa María Tlalixtac	20438	5.8	0.6	44.2	169.3	20.4	18.4	1.8
Oaxaca	Santa María Tonameca	20439	247.9	8.8	637.8	2,486.0	327.2	290.2	22.9
Oaxaca	Santa María Totolapilla	20440	3.9	0.4	33.9	130.0	21.6	15.5	1.2
Oaxaca	Santa María Xadani	20441	19.2	2.5	128.7	419.3	47.8	41.7	6.5
Oaxaca	Santa María Yalina	20442	1.4	0.2	11.2	40.2	7.3	4.7	0.4
Oaxaca	Santa María Yavesía	20443	1.8	0.4	17.4	52.4	10.6	6.3	0.5
Oaxaca	Santa María Yolotepec	20444	1.7	0.2	14.1	54.8	8.5	6.2	0.5
Oaxaca	Santa María Yosoyúa	20445	4.5	0.5	34.1	132.7	16.5	14.1	1.4
Oaxaca	Santa María Yuquihiti	20446	23.6	2.0	174.8	686.7	78.5	71.5	7.4
Oaxaca	Santa María Zacatepec	20447	68.6	5.9	447.0	1,697.0	216.3	182.9	17.5
Oaxaca	Santa María Zaniza	20448	7.3	0.6	55.7	234.5	34.9	26.1	1.9
Oaxaca	Santa María Zoquitlán	20449	15.3	1.8	102.8	385.8	67.8	45.9	3.9
Oaxaca	Santiago Amoltepec	20450	35.0	2.9	269.5	1,067.2	129.2	113.8	10.8
Oaxaca	Santiago Apoala	20451	5.0	0.5	39.1	152.3	21.2	16.7	1.5
Oaxaca	Santiago Apóstol	20452	29.4	2.1	94.5	342.5	34.3	32.0	5.3
Oaxaca	Santiago Astata	20453	20.1	1.8	77.2	277.7	37.2	31.5	2.9
Oaxaca	Santiago Atitlán	20454	10.0	0.9	76.4	299.4	37.2	31.9	3.1
Oaxaca	Santiago Ayuquililla	20455	9.0	1.2	77.5	277.1	38.2	30.5	2.7
Oaxaca	Santiago Cacaloxtepec	20456	4.4	0.6	27.6	101.1	12.2	9.8	1.5
Oaxaca	Santiago Camotlán	20457	11.8	1.1	102.1	405.3	64.0	47.0	3.5
Oaxaca	Santiago Comaltepec	20458	5.9	0.7	50.4	197.1	33.3	23.1	1.8
Oaxaca	Santiago Chazumba	20459	22.1	1.9	96.1	346.0	55.2	37.1	4.9
Oaxaca	Santiago Choapam	20460	18.0	1.8	151.7	539.7	90.7	62.5	2,891.9
Oaxaca	Santiago del Río	20461	13.1	0.4	20.2	76.4	10.3	8.9	0.8
Oaxaca	Santiago Huajolotitlán	20462	15.6	1.8	81.2	297.0	38.8	29.5	4.5
Oaxaca	Santiago Huacuilla	20463	36.1	0.8	30.5	113.2	19.3	13.4	1.1
Oaxaca	Santiago Ihuatlán Plumas	20464	12.5	0.4	21.3	56.1	9.6	6.9	0.7

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Oaxaca	Santiago Ixcuintepec	20465	24.0	0.6	152.5	817.1	101.1	86.3	1.4
Oaxaca	Santiago Ixtayutla	20466	51.3	3.6	369.0	1,566.6	202.0	170.2	12.1
Oaxaca	Santiago Jamiltepec	20467	153.2	10.2	521.8	1,767.6	255.4	201.1	3,835.1
Oaxaca	Santiago Jocotepec	20468	70.2	4.8	461.0	1,826.2	249.8	212.2	14.4
Oaxaca	Santiago Juxtapahuaca	20469	127.3	16.7	881.3	3,549.7	429.7	363.0	3,030.5
Oaxaca	Santiago Lachiguirí	20470	46.4	2.0	326.9	1,524.6	204.9	166.6	7.2
Oaxaca	Santiago Lalopa	20471	2.0	0.5	14.9	55.2	7.5	6.1	0.6
Oaxaca	Santiago Laollaga	20472	12.1	1.6	65.5	232.8	40.9	26.5	3.2
Oaxaca	Santiago Laxopa	20473	5.4	0.9	44.5	160.7	24.1	17.9	1.6
Oaxaca	Santiago Llano Grande	20474	64.3	1.9	95.1	358.9	49.2	43.5	3.7
Oaxaca	Santiago Matatlán	20475	34.8	4.8	198.7	710.3	81.4	70.1	9.9
Oaxaca	Santiago Miltepec	20476	1.4	0.2	10.5	39.3	5.9	4.3	0.5
Oaxaca	Santiago Minas	20477	6.0	0.6	47.0	178.5	30.9	20.9	1.9
Oaxaca	Santiago Nacaltepec	20478	11.7	0.9	74.6	291.1	42.7	32.9	2.7
Oaxaca	Santiago Nejapilla	20479	1.0	0.2	7.6	28.8	4.1	3.2	0.3
Oaxaca	Santiago Nundiche	20480	6.4	0.5	30.3	116.5	16.8	13.1	1.2
Oaxaca	Santiago Pinotepa Nacional	20482	166.7	3.0	102.2	401.5	61.6	56.8	4.4
Oaxaca	Santiago Suchilquitongo	20483	143.9	35.5	1,020.2	3,433.8	399.4	347.1	49.1
Oaxaca	Santiago Tamazola	20484	64.2	3.4	140.0	500.7	50.6	44.6	8.9
Oaxaca	Santiago Tapextla	20485	17.7	2.3	119.3	436.9	55.7	46.0	5.0
Oaxaca	Villa Tejupam de la Unión	20486	38.2	1.7	106.6	415.6	57.7	49.2	3.6
Oaxaca	Santiago Tenango	20487	7.1	1.1	53.7	199.1	28.6	20.9	2.6
Oaxaca	Santiago Tepetlapa	20488	9.8	0.6	46.5	178.8	25.8	19.7	1.9
Oaxaca	Santiago Tetepéc	20489	1.3	0.2	4.0	13.5	2.3	1.5	0.3
Oaxaca	Santiago Texcalcingo	20490	17.9	1.8	146.0	559.8	78.5	62.9	5.6
Oaxaca	Santiago Nuyoó	20481	23.1	1.1	74.5	293.8	33.4	31.3	3.1
Oaxaca	Santiago Textitlán	20491	18.7	1.2	146.2	586.5	79.7	63.5	3.8
Oaxaca	Santiago Tilantongo	20492	21.6	1.3	101.6	391.5	52.3	42.3	4.4
Oaxaca	Santiago Tillo	20493	27.7	0.5	12.8	38.4	6.6	5.8	0.6
Oaxaca	Santiago Tlazoyaltepec	20494	15.7	1.4	118.3	466.6	53.3	48.9	4.9
Oaxaca	Santiago Xanica	20495	12.3	1.1	97.1	374.0	49.5	41.7	3.7
Oaxaca	Santiago Xiacuí	20496	5.7	0.6	35.6	132.4	15.5	12.8	2.0
Oaxaca	Santiago Yaitepec	20497	11.3	1.2	84.3	328.4	37.6	34.2	3.5
Oaxaca	Santiago Yaveo	20498	51.3	2.4	222.0	857.2	160.9	107.1	7.5
Oaxaca	Santiago Yolomécatl	20499	5.6	1.1	34.5	114.4	14.0	10.7	2.0
Oaxaca	Santiago Yosondúa	20500	32.8	2.6	212.3	824.1	103.3	88.4	8.6
Oaxaca	Santiago Yucuyachi	20501	4.2	0.7	31.4	117.7	15.7	12.5	1.3
Oaxaca	Santiago Záratepec	20502	18.0	1.9	135.9	530.0	67.0	56.5	5.6

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1999 Mexico National Emissions Inventory (Final)
Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	Santiago Zoolchila	20503	1.7	0.2	12.6	44.7	5.2	4.6	0.5
Oaxaca	Nuevo Zoquiapam	20504	6.1	0.8	44.8	163.2	22.9	17.3	2.0
Oaxaca	Santo Domingo Ingenio	20505	62.2	4.3	137.8	397.9	54.2	40.2	8.3
Oaxaca	Santo Domingo Albarradas	20506	2.8	0.3	26.2	88.7	17.5	10.7	0.9
Oaxaca	Santo Domingo Armenta	20507	20.2	1.5	97.1	368.0	51.0	41.7	3.8
Oaxaca	Santo Domingo Chihuitán	20508	15.5	0.8	35.9	126.2	21.6	14.9	1.7
Oaxaca	Santo Domingo de Morelos	20509	46.6	3.2	270.3	1,053.8	128.6	117.4	9.9
Oaxaca	Santo Domingo Ixcatlán	20510	3.2	0.3	24.1	93.6	11.0	9.8	1.0
Oaxaca	Santo Domingo Nuxáá	20511	12.5	1.1	96.0	376.6	48.7	40.5	3.9
Oaxaca	Santo Domingo Ozolotepec	20512	8.6	0.5	58.6	281.7	34.5	29.8	1.3
Oaxaca	Santo Domingo Petapa	20513	48.7	2.9	314.2	1,416.9	181.3	151.8	8.4
Oaxaca	Santo Domingo Roayaga	20514	3.4	0.3	26.7	104.3	14.6	11.4	1.1
Oaxaca	Santo Domingo Tehuantepec	20515	297.0	107.1	1,164.0	3,489.2	512.1	378.6	3,632.9
Oaxaca	Santo Domingo Teojomulco	20516	16.6	1.6	125.4	487.0	66.5	54.0	4.9
Oaxaca	Santo Domingo Tepuxtepec	20517	14.6	1.4	111.2	431.4	51.6	45.6	4.5
Oaxaca	Santo Domingo Tlatayapam	20518	0.6	0.2	4.2	12.1	1.8	1.2	0.2
Oaxaca	Santo Domingo Tomaltepec	20519	17.8	1.6	70.9	285.9	19.3	17.5	3.4
Oaxaca	Santo Domingo Tonalá	20520	39.9	3.6	158.3	539.7	64.5	55.2	8.3
Oaxaca	Santo Domingo Tonaltepec	20521	1.2	0.1	9.4	36.4	5.4	4.1	0.4
Oaxaca	Santo Domingo Xagacia	20522	3.8	0.6	30.2	111.0	14.8	12.0	1.2
Oaxaca	Santo Domingo Yanhuitlán	20523	60.1	1.5	39.7	145.4	22.4	19.3	1.8
Oaxaca	Santo Domingo Yodohino	20524	1.9	0.2	14.4	54.7	8.0	6.0	0.6
Oaxaca	Santo Domingo Zanatepec	20525	93.4	6.5	271.4	916.7	139.0	103.6	11.9
Oaxaca	Santos Reyes Nopala	20526	66.3	6.2	411.4	1,586.4	190.6	173.7	15.9
Oaxaca	Santos Reyes Pápalo	20527	9.5	0.8	74.3	294.7	36.3	31.7	2.9
Oaxaca	Santos Reyes Tepejillo	20528	7.7	0.9	36.3	137.2	18.0	14.5	1.7
Oaxaca	Santos Reyes Yucuná	20529	5.3	0.5	41.7	165.3	22.6	18.1	1.7
Oaxaca	Santo Tomás Jalieza	20530	12.3	1.3	84.4	334.7	39.2	34.1	3.5
Oaxaca	Santo Tomás Mazaltepec	20531	19.9	0.9	53.8	179.2	22.7	19.4	2.2
Oaxaca	Santo Tomás Ocotepec	20532	15.0	1.3	112.3	441.6	52.6	46.5	4.7
Oaxaca	Santo Tomás Tamazulapan	20533	5.9	1.0	38.4	145.9	16.5	14.5	1.9
Oaxaca	San Vicente Coatlán	20534	15.3	1.4	119.7	438.5	54.5	47.6	4.7
Oaxaca	San Vicente Lachixío	20535	12.1	1.2	93.1	370.2	48.8	40.0	3.8
Oaxaca	San Vicente Nuñú	20536	1.9	0.5	15.1	56.3	11.6	6.8	0.6
Oaxaca	Silacayoapam	20537	760.1	4,569.9	723.4	1,480.4	1,652.6	738.2	1,635.1
Oaxaca	Sitio de Xitlapehua	20538	2.4	0.2	19.8	76.4	9.5	8.3	0.7
Oaxaca	Soledad Etla	20539	13.6	1.9	43.1	131.3	7.9	6.9	4.4

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1999 Mexico National Emissions Inventory (Final)
Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Oaxaca	Villa de Tamazulapam del Progreso	20540	34.9	5.9	117.2	347.8	41.1	31.6	6.9
Oaxaca	Tanetze de Zaragoza	20541	6.8	1.4	50.0	182.6	21.1	19.4	2.1
Oaxaca	Taniche	20542	5.5	0.3	19.4	73.3	8.0	7.4	1.0
Oaxaca	Tataltepec de Valdés	20543	68.0	2.0	445.3	2,281.6	276.0	241.3	6.0
Oaxaca	Teococulco de Marcos Pérez	20544	8.3	0.8	37.4	137.0	21.1	14.4	2.0
Oaxaca	Teotitlán de Flores Magón	20545	29.3	6.3	153.2	425.9	43.5	38.4	8.5
Oaxaca	Teotitlán del Valle	20546	26.1	3.4	147.1	295.2	32.1	25.1	334.3
Oaxaca	Teotongo	20547	24.4	0.8	28.6	107.5	16.8	13.5	1.1
Oaxaca	Tepelmeme Villa de Morelos	20548	13.5	1.1	53.6	202.6	56.4	28.1	1.8
Oaxaca	Tezoatlán de Segura y Luna	20549	48.2	4.8	318.6	1,173.5	151.7	123.2	14.0
Oaxaca	San Jerónimo Tlacoahuaya	20550	35.8	2.2	87.1	301.6	31.2	28.3	5.4
Oaxaca	Tlacolula de Matamoros	20551	51.8	11.3	247.9	670.7	64.0	52.5	781.1
Oaxaca	Tlacotepec Plumas	20552	9.7	0.4	15.5	58.5	10.0	7.3	0.6
Oaxaca	Tlalixtac de Cabrera	20553	61.5	10.7	191.7	737.1	52.7	46.6	8.1
Oaxaca	Totontepec Villa de Morelos	20554	21.9	2.2	166.7	661.5	87.3	71.3	6.4
Oaxaca	Trinidad Zaachila	20555	9.0	0.8	52.7	196.3	19.7	18.0	3.2
Oaxaca	La Trinidad Vista Hermosa	20556	9.0	0.3	10.0	37.5	5.4	4.7	0.4
Oaxaca	Unión Hidalgo	20557	37.0	7.2	201.9	522.3	47.9	40.6	13.8
Oaxaca	Valerio Trujano	20558	5.6	0.6	43.3	163.4	20.7	17.9	1.7
Oaxaca	San Juan Bautista Valle Nacional	20559	127.6	11.6	739.3	2,765.0	354.0	311.1	25.9
Oaxaca	Villa Díaz Ordaz	20560	19.0	1.9	130.5	487.0	64.4	50.2	6.3
Oaxaca	Yaxe	20561	8.3	0.9	66.3	241.1	29.6	25.6	2.6
Oaxaca	Magdalena Yodocono de Porfirio Díaz	20562	4.5	0.6	33.4	114.2	13.9	11.6	1.5
Oaxaca	Yogana	20563	5.2	0.6	40.7	148.3	21.6	16.7	1.6
Oaxaca	Yutanduchi de Guerrero	20564	7.1	0.5	51.4	218.4	27.7	23.1	1.4
Oaxaca	Villa de Zaachila	20565	82.1	11.8	327.3	969.3	83.5	75.5	391.7
Oaxaca	Zapotitlán del Río	20566	12.3	1.0	95.4	371.8	55.4	42.2	3.6
Oaxaca	Zapotitlán lagunas	20567	27.8	1.7	92.7	356.2	54.0	40.3	3.9
Oaxaca	Zapotitlán Palmas	20568	13.2	0.9	37.2	140.3	17.8	15.0	1.8
Oaxaca	Santa Inés de Zaragoza	20569	7.1	0.7	54.3	210.0	27.9	22.6	2.2
Oaxaca	Zimatlán de Alvarez	20570	63.6	8.7	366.3	1,201.8	159.6	116.7	19.0
Oaxaca Total			32,155.1	61,819.8	95,962.9	332,012.7	45,594.5	35,910.9	61,770.2
Puebla	Acajete	21001	397.6	21.9	851.3	2,639.7	3,876.9	3,635.6	296.2
Puebla	Acateno	21002	45.4	4.4	305.1	1,078.3	129.5	117.4	414.4
Puebla	Acatlán	21003	152.4	23.7	747.0	2,208.3	233.4	204.2	374.1
Puebla	Acatzingo	21004	239.3	24.9	847.9	2,569.2	265.6	222.5	399.0

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Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Puebla	Acteopan	21005	30.4	1.8	150.4	376.9	54.4	42.9	98.9
Puebla	Ahuacatlán	21006	59.4	3.6	358.1	1,312.3	151.9	138.3	289.4
Puebla	Ahuatlán	21007	18.0	1.3	121.2	439.1	60.4	49.4	90.3
Puebla	Ahuazotepec	21008	49.2	4.5	185.1	617.6	77.6	58.9	117.6
Puebla	Ahuehuetitla	21009	11.4	1.1	61.6	201.1	30.1	21.5	112.2
Puebla	Ajalpan	21010	236.7	20.3	1,483.1	4,249.8	493.7	435.0	774.1
Puebla	Albino Zertuche	21011	8.6	1.1	45.8	145.3	23.3	15.5	189.1
Puebla	Aljojuca	21012	124.4	3.7	129.6	383.0	97.3	51.8	163.7
Puebla	Altepexi	21013	121.9	9.3	327.2	793.4	69.6	66.4	160.1
Puebla	Amixtlán	21014	21.5	2.0	129.6	456.0	52.3	47.6	275.3
Puebla	Amozoc	21015	534.9	191.5	1,250.5	4,720.3	198.5	138.9	237.4
Puebla	Aquixtla	21016	34.1	2.3	203.1	706.9	109.1	77.2	339.3
Puebla	Atempan	21017	87.2	6.8	441.6	1,585.3	171.0	154.2	98.1
Puebla	Atexcal	21018	18.9	1.2	89.4	274.5	54.3	31.3	203.9
Puebla	Atlixco	21019	623.8	87.0	1,873.6	4,903.4	401.4	335.3	544.0
Puebla	Atoyatempan	21020	24.7	3.1	120.0	340.3	38.0	29.5	301.8
Puebla	Atzala	21021	5.8	0.7	36.8	142.5	16.9	13.2	71.4
Puebla	Atzitzihuacán	21022	61.0	4.9	309.4	1,092.3	133.1	111.9	110.6
Puebla	Atzitzintla	21023	44.0	3.1	170.6	543.9	87.7	56.2	164.4
Puebla	Axutla	21024	6.4	0.5	26.9	74.8	13.5	7.8	126.5
Puebla	Ayotoxco de Guerrero	21025	40.0	4.1	267.7	962.3	117.1	106.1	407.6
Puebla	Calpan	21026	62.8	5.2	267.4	902.4	110.4	84.7	99.7
Puebla	Caltepec	21027	25.3	1.6	150.2	522.1	86.2	59.4	507.1
Puebla	Camocuautla	21028	10.0	0.7	62.7	223.6	27.3	24.0	141.2
Puebla	Caxhuacan	21029	17.0	1.5	89.6	300.4	35.7	30.1	61.5
Puebla	Coatepec	21030	4.1	0.4	25.0	88.2	11.3	9.5	91.0
Puebla	Coatzingo	21031	45.7	2.3	99.0	323.5	49.2	38.1	85.0
Puebla	Cohetzala	21032	8.6	0.7	54.7	183.4	29.6	21.0	87.0
Puebla	Cohuecán	21033	23.4	1.8	164.3	524.6	65.6	56.2	71.3
Puebla	Coronango	21034	168.9	16.9	547.6	1,950.4	98.0	91.7	122.2
Puebla	Coxcatlán	21035	209.0	542.0	482.4	1,539.6	382.6	229.2	145.6
Puebla	Coyomeapan	21036	58.1	3.9	367.9	1,354.6	177.1	145.4	126.3
Puebla	Coyotepec	21037	15.7	1.0	58.4	163.2	42.3	20.4	132.6
Puebla	Cuapiaxtla de Madero	21038	48.4	3.3	108.6	293.4	26.1	20.9	75.9
Puebla	Cuautempan	21039	40.4	2.9	242.8	892.4	105.3	91.8	276.4
Puebla	Cuautinchán	21040	44.4	2.2	166.3	531.8	87.2	57.3	136.7
Puebla	Cuautlancingo	21041	1,665.1	2,299.2	7,244.2	2,385.9	509.0	364.5	141.5
Puebla	Cuayuca de Andrade	21042	21.6	1.6	122.4	427.6	65.7	49.3	116.8

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Mg/year, by Municipality (*Excluding Natural Sources*)

State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Puebla	Cuetzalan del Progreso	21043	205.1	18.3	1,253.8	4,434.1	519.3	467.1	240.3
Puebla	Cuyoaco	21044	143.3	5.5	309.6	999.3	139.4	101.1	265.4
Puebla	Chalchicomula de Sesma	21045	277.5	22.1	682.3	1,903.9	313.9	180.4	512.3
Puebla	Chapulco	21046	60.6	2.4	117.3	319.6	36.7	28.0	214.2
Puebla	Chiautla	21047	98.3	12.3	484.9	1,479.9	181.9	146.0	402.3
Puebla	Chiautzingo	21048	88.1	6.8	324.2	1,089.4	106.8	93.4	163.9
Puebla	Chiconcuautla	21049	58.7	4.3	363.4	1,358.2	154.6	140.3	67.4
Puebla	Chichiquila	21050	91.8	6.2	567.8	2,159.4	251.6	224.8	111.2
Puebla	Chietla	21051	511.0	1,189.5	1,026.5	2,847.9	1,163.8	585.5	243.8
Puebla	Chigmecatitlán	21052	7.2	0.7	49.6	105.2	11.7	10.2	22.5
Puebla	Chignahuapan	21053	304.6	26.7	1,231.7	4,137.6	538.3	417.9	977.5
Puebla	Chignautla	21054	108.9	7.8	522.2	1,689.9	179.7	158.0	143.2
Puebla	Chila	21055	26.3	6,389.1	127.7	391.0	53.3	39.8	15.7
Puebla	Chila de la Sal	21056	8.6	0.8	40.9	123.3	19.0	12.6	64.1
Puebla	Honey	21057	32.6	3.1	196.0	697.6	96.2	74.3	102.5
Puebla	Chilchotla	21058	81.1	6.9	493.6	1,829.4	229.8	192.8	147.7
Puebla	Chinantla	21059	16.7	1.6	55.9	165.0	21.3	16.0	80.7
Puebla	Domingo Arenas	21060	25.6	2.4	121.6	423.8	48.2	40.6	35.8
Puebla	Eloxochitlán	21061	51.0	3.6	345.3	1,295.1	178.6	143.8	113.9
Puebla	Epatlán	21062	21.9	1.8	112.7	383.5	51.6	38.8	92.5
Puebla	Esperanza	21063	119.0	8.3	211.3	575.3	80.1	47.2	197.2
Puebla	Francisco Z. Mena	21064	79.0	6.9	540.0	1,888.0	225.3	204.7	922.0
Puebla	General Felipe Angeles	21065	85.6	6.4	307.9	995.2	146.8	99.8	262.5
Puebla	Guadalupe	21066	34.1	3.0	198.5	643.8	92.4	68.9	28.5
Puebla	Guadalupe Victoria	21067	99.5	8.4	310.5	890.0	153.7	92.6	270.9
Puebla	Hermenegildo Galeana	21068	37.5	2.7	228.6	817.0	92.1	85.4	30.1
Puebla	Huaquechula	21069	209.4	10.0	603.4	2,122.6	217.7	186.3	242.7
Puebla	Huatlatlauca	21070	38.7	2.4	223.5	772.6	99.8	81.1	101.3
Puebla	Huauchinango	21071	334.5	53.5	1,563.2	4,637.1	430.1	377.0	311.7
Puebla	Huehuetla	21072	84.0	6.6	587.3	2,251.8	266.7	250.6	122.1
Puebla	Huehuetlán el Chico	21073	42.8	5.6	241.0	810.5	110.3	85.8	176.3
Puebla	Huejotzingo	21074	337.8	39.8	1,011.3	2,299.9	181.3	144.1	458.5
Puebla	Hueyapan	21075	46.6	4.9	275.1	970.5	113.0	99.0	71.5
Puebla	Hueytamalco	21076	130.4	10.5	821.5	2,743.8	304.9	284.3	531.5
Puebla	Hueytlalpan	21077	25.1	1.7	154.7	568.1	68.3	60.8	52.2
Puebla	Huitzilan de Serdán	21078	53.4	3.6	323.3	1,180.1	133.2	123.7	129.8
Puebla	Huitziltepec	21079	18.1	1.3	77.9	217.6	31.7	18.6	200.7
Puebla	Atlequizayan	21080	12.0	0.8	65.7	227.4	29.0	23.6	34.2

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Puebla	Ixcamilpa de Guerrero	21081	21.2	1.8	133.3	460.4	69.5	52.0	134.0
Puebla	Ixcaquixtla	21082	31.2	3.9	115.0	310.0	53.2	27.8	208.8
Puebla	Ixtacamaxtitlán	21083	136.7	7.8	755.6	2,727.7	365.9	289.3	440.8
Puebla	Ixtepec	21084	28.7	2.0	154.8	542.9	60.7	54.5	68.3
Puebla	Izúcar de Matamoros	21085	536.9	582.8	1,308.0	3,695.1	571.9	453.1	545.2
Puebla	Jalpan	21086	66.9	4.5	549.7	1,783.1	209.4	196.8	310.4
Puebla	Jolalpan	21087	60.4	5.1	389.6	1,335.6	196.9	151.5	148.9
Puebla	Jonotla	21088	23.2	1.8	147.6	535.4	64.4	57.7	84.1
Puebla	Jopala	21089	60.9	4.8	366.6	1,287.6	151.4	135.0	270.2
Puebla	Juan C. Bonilla	21090	63.7	7.8	291.5	605.6	58.5	41.5	204.9
Puebla	Juan Galindo	21091	36.7	6.0	135.8	352.8	24.7	22.9	18.5
Puebla	Juan N. Méndez	21092	23.2	1.8	132.5	404.1	66.5	43.3	127.3
Puebla	Lafragua	21093	44.8	2.8	229.5	803.3	139.1	90.5	201.9
Puebla	Libres	21094	256.6	17.3	501.1	1,511.9	218.5	147.8	376.4
Puebla	La Magdalena Tlatlauquitepec	21095	3.4	0.3	24.3	98.8	13.4	10.8	86.8
Puebla	Mazapiltepec de Juárez	21096	62.2	1.4	47.1	133.0	25.6	15.1	69.2
Puebla	Mixtla	21097	10.9	0.8	31.8	94.9	13.7	8.2	37.8
Puebla	Molcaxac	21098	27.8	2.3	144.3	491.5	80.5	52.7	133.1
Puebla	Cañada Morelos	21099	139.1	6.5	312.8	900.0	126.2	79.5	290.0
Puebla	Naupan	21100	43.6	3.1	267.5	1,002.5	115.5	103.5	76.7
Puebla	Nauzontla	21101	16.2	1.2	95.7	337.8	39.1	34.2	41.5
Puebla	Nealtican	21102	43.8	5.3	197.1	585.4	68.7	49.9	52.5
Puebla	Nicolás Bravo	21103	22.9	2.1	116.4	393.0	42.0	36.3	264.3
Puebla	Nopalucan	21104	204.6	9.1	374.7	1,238.8	179.4	125.1	242.4
Puebla	Ocotepec	21105	45.3	1.7	104.3	347.0	53.9	36.8	110.6
Puebla	Ocoyucan	21106	133.9	11.4	444.6	1,438.8	104.2	93.1	469.4
Puebla	Olintla	21107	60.6	4.5	407.7	1,533.9	180.8	167.3	81.1
Puebla	Oriental	21108	94.2	7.2	232.7	609.5	106.7	56.3	238.4
Puebla	Pahuatlán	21109	83.3	8.2	498.9	1,684.4	182.2	171.3	116.6
Puebla	Palmar de Bravo	21110	177.9	14.5	742.2	2,368.2	348.3	230.4	1,158.9
Puebla	Pantepec	21111	98.9	8.2	705.1	2,658.5	319.4	294.7	571.0
Puebla	Petzalcingo	21112	46.5	3.7	256.9	863.4	130.3	95.9	126.3
Puebla	Piaxtla	21113	26.1	2.4	124.3	387.1	45.7	37.1	151.8
Puebla	Puebla	21114	11,909.4	3,775.1	37,733.1	106,536.2	3,146.3	2,436.4	1,675.1
Puebla	Quecholac	21115	171.7	14.8	702.9	2,257.9	239.2	192.9	538.6
Puebla	Quimixtlán	21116	87.1	5.8	542.7	2,045.2	243.1	213.8	111.2
Puebla	Rafael Lara Grajales	21117	94.9	12.7	317.4	480.9	35.9	25.7	114.8
Puebla	Los Reyes de Juárez	21118	111.6	9.0	296.5	872.1	74.8	60.1	123.0

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Puebla	San Andrés Cholula	21119	394.5	61.4	1,113.2	3,394.5	117.2	97.1	488.4
Puebla	San Antonio Cañada	21120	20.2	1.4	122.0	457.7	49.1	46.3	429.9
Puebla	San Diego la Mesa Tochimiltzingo	21121	6.1	0.4	30.1	100.1	14.1	10.6	86.0
Puebla	San Felipe Teotlalcingo	21122	34.7	2.7	154.7	514.7	60.6	45.5	144.3
Puebla	San Felipe Tepatlán	21123	20.3	1.3	124.7	452.1	51.5	47.6	30.5
Puebla	San Gabriel Chilac	21124	60.3	6.8	283.9	810.3	76.0	71.2	181.2
Puebla	San Gregorio Atzompa	21125	53.6	5.6	486.6	436.4	16.8	12.4	205.9
Puebla	San Jerónimo Tecuanipan	21126	26.3	1.3	101.2	347.2	48.9	33.9	37.1
Puebla	San Jerónimo Xayacatlán	21127	20.1	1.5	123.6	417.0	52.1	44.5	73.7
Puebla	San José Chiapa	21128	85.1	2.8	110.2	322.6	43.1	28.7	148.1
Puebla	San José Miahuatlán	21129	55.4	5.2	271.4	920.4	110.9	92.6	755.9
Puebla	San Juan Atenco	21130	86.2	2.4	72.2	217.3	51.1	28.5	96.5
Puebla	San Juan Atzompa	21131	4.2	0.4	28.5	75.4	9.8	7.7	47.9
Puebla	San Martín Texmelucan	21132	1,220.3	728.4	2,935.1	3,662.9	916.7	614.9	857.4
Puebla	San Martín Totoltepec	21133	3.9	0.5	17.0	49.2	8.6	5.0	6.7
Puebla	San Matías Tlalancaleca	21134	73.2	5.4	218.1	597.2	63.3	38.6	306.2
Puebla	San Miguel Ixtlán	21135	4.0	0.3	29.7	71.3	15.1	8.8	5.6
Puebla	San Miguel Xoxtla	21136	428.1	16.3	220.7	963.3	404.5	381.5	41.8
Puebla	San Nicolás Buenos Aires	21137	82.5	3.2	155.7	478.6	119.1	59.1	300.4
Puebla	San Nicolás de los Ranchos	21138	53.5	5.3	271.4	1,061.1	123.2	103.8	62.6
Puebla	San Pablo Anicano	21139	16.7	1.7	94.8	328.0	39.9	34.4	49.1
Puebla	San Pedro Cholula	21140	473.3	158.7	1,952.0	3,534.4	245.8	202.7	457.2
Puebla	San Pedro Yeloixtlahuaca	21141	18.3	1.6	91.5	308.4	37.8	31.7	82.0
Puebla	San Salvador el Seco	21142	189.3	13.5	423.3	1,078.4	174.5	100.4	319.6
Puebla	San Salvador el Verde	21143	126.7	8.6	341.0	958.9	108.9	72.4	309.3
Puebla	San Salvador Huixcolotla	21144	47.6	15.6	170.3	435.6	40.4	29.5	231.0
Puebla	San Sebastián Tlacotepec	21145	64.8	5.0	458.0	1,707.3	226.8	193.2	252.6
Puebla	Santa Catarina Tlaltepan	21146	4.4	0.5	28.5	79.6	9.6	8.1	10.6
Puebla	Santa Inés Ahuateapan	21147	28.5	2.9	174.5	541.3	401.5	357.6	358.8
Puebla	Santa Isabel Cholula	21148	42.6	2.0	146.2	490.2	50.6	41.1	81.1
Puebla	Santiago Miahuatlán	21149	96.4	6.4	791.7	696.5	73.8	55.3	310.2
Puebla	Huehuetlán el Grande	21150	30.8	2.7	187.6	656.2	89.0	71.5	146.8
Puebla	Santo Tomás Hueyotlipan	21151	27.8	2.6	97.7	269.8	23.9	16.8	146.2
Puebla	Soltepec	21152	113.5	4.9	233.4	782.5	127.6	86.3	157.9
Puebla	Tecali de Herrera	21153	76.9	6.0	282.3	751.3	84.0	57.1	179.0
Puebla	Tecamachalco	21154	377.4	49.2	978.0	2,672.3	280.1	206.0	2,718.0
Puebla	Tecomatlán	21155	29.9	2.6	154.9	490.8	67.7	50.5	108.8
Puebla	Tehuacán	21156	1,612.8	631.2	5,370.3	13,393.6	500.2	397.3	5,799.9

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Puebla	Tehuitzingo	21157	56.4	6.1	308.3	968.2	108.8	95.7	80.4
Puebla	Tenampulco	21158	39.8	2.8	209.3	743.2	93.0	80.8	441.8
Puebla	Teopantlán	21159	35.0	2.3	184.0	519.3	72.4	57.4	21.9
Puebla	Teotlalco	21160	21.4	1.3	86.5	288.1	44.9	32.1	100.7
Puebla	Tepanco de López	21161	136.3	8.5	524.5	977.7	127.7	90.5	1,639.5
Puebla	Tepango de Rodríguez	21162	18.6	1.6	113.6	421.4	46.3	42.8	169.0
Puebla	Tepatlaxco de Hidalgo	21163	63.3	6.5	191.9	556.8	59.1	38.6	70.2
Puebla	Tepeaca	21164	413.8	104.0	1,062.0	2,921.2	399.4	262.6	456.0
Puebla	Tepemaxalco	21165	7.7	0.7	50.2	159.4	23.9	18.2	8.6
Puebla	Tepeojuma	21166	79.6	3.8	166.6	596.8	69.2	51.2	104.3
Puebla	Tepetzintla	21167	42.8	2.8	263.4	995.5	113.5	102.8	171.1
Puebla	Tepexco	21168	32.0	3.0	213.3	647.9	98.1	73.4	142.3
Puebla	Tepexi de Rodríguez	21169	80.3	6.1	397.2	1,255.5	213.1	132.3	327.6
Puebla	Tepeyahualco	21170	243.0	5.7	345.5	1,057.1	230.0	131.7	254.5
Puebla	Tepeyahualco de Cuauhtémoc	21171	14.1	1.3	56.3	137.8	17.3	11.1	207.5
Puebla	Tetela de Ocampo	21172	115.4	9.8	659.0	2,337.0	260.3	230.6	397.0
Puebla	Teteles de Ávila Castillo	21173	23.3	2.6	110.9	263.1	31.5	21.0	80.3
Puebla	Teziutlán	21174	386.4	111.4	1,956.6	3,383.4	319.2	290.0	327.8
Puebla	Tianguismanalco	21175	40.8	3.2	197.0	661.7	73.3	60.1	112.9
Puebla	Tilapa	21176	73.1	3.0	165.0	560.4	78.7	56.7	113.5
Puebla	Tlacotepec de Benito Juárez	21177	255.8	17.2	931.6	2,739.8	335.5	256.5	2,007.8
Puebla	Tlacuilotepec	21178	85.4	5.9	577.7	2,134.0	251.9	232.3	405.8
Puebla	Tlachichuca	21179	244.3	11.3	559.9	1,766.6	319.5	199.5	422.7
Puebla	Tlahuapan	21180	178.7	11.7	592.9	1,846.1	251.6	170.5	847.8
Puebla	Tlaltenango	21181	45.4	4.3	113.8	542.9	42.1	23.3	75.8
Puebla	Tlanepantla	21182	20.0	2.3	94.4	195.2	21.7	15.2	134.3
Puebla	Tlaola	21183	82.3	5.5	489.2	1,759.2	203.6	184.1	90.3
Puebla	Tlapacoya	21184	29.7	2.0	181.5	656.3	78.6	69.8	141.5
Puebla	Tlapanalá	21185	51.3	3.0	171.1	549.3	70.4	52.2	129.1
Puebla	Tlatlauquitepec	21186	231.0	19.1	1,154.1	3,753.5	386.6	354.2	377.2
Puebla	Tlaxco	21187	28.2	2.3	167.7	587.9	68.0	61.1	199.9
Puebla	Tochimilco	21188	77.7	5.2	419.1	1,519.5	175.3	151.7	268.2
Puebla	Tochtepec	21189	90.9	7.9	274.5	794.1	80.7	60.8	848.6
Puebla	Totoltepec de Guerrero	21190	5.3	0.6	32.7	103.3	14.7	11.2	56.3
Puebla	Tulcingo	21191	47.0	7.3	238.9	715.3	79.2	67.2	170.8
Puebla	Tuzamapan de Galeana	21192	28.3	2.1	171.9	609.7	70.2	64.0	82.5
Puebla	Tzicatlacoyan	21193	31.8	1.9	170.4	579.7	84.7	62.8	93.3
Puebla	Venustiano Carranza	21194	115.5	13.8	668.5	2,138.8	236.2	215.3	1,141.3

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State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
Puebla	Vicente Guerrero	21195	96.8	7.0	604.8	2,215.6	275.6	233.6	194.9
Puebla	Xayacatlán de Bravo	21196	7.7	0.8	44.2	150.2	18.1	15.5	63.0
Puebla	Xicotepec	21197	286.7	46.5	1,454.5	3,972.7	374.1	346.7	489.2
Puebla	Xicotlán	21198	6.7	0.7	43.5	142.5	25.7	17.0	128.4
Puebla	Xiutetelco	21199	131.0	10.0	668.5	2,227.2	223.3	203.6	162.2
Puebla	Xochiapulco	21200	20.0	1.5	117.6	429.2	51.4	43.9	45.2
Puebla	Xochitltepēc	21201	14.1	1.2	74.4	252.1	33.3	25.8	91.2
Puebla	Xochitlán de Vicente Suárez	21202	52.9	3.6	308.0	1,103.5	121.7	113.5	77.0
Puebla	Xochitlán Todos Santos	21203	29.1	2.1	107.4	338.7	62.0	36.7	209.6
Puebla	Yaonáhuac	21204	28.6	2.7	152.9	514.6	59.4	49.6	65.3
Puebla	Yehualtepec	21205	106.3	8.3	342.8	1,025.9	119.9	86.9	500.8
Puebla	Zacapala	21206	22.5	1.6	116.2	380.0	72.5	45.4	307.8
Puebla	Zacapoaxtla	21207	232.0	25.5	1,198.4	4,039.9	416.4	385.7	209.9
Puebla	Zacatlán	21208	291.4	36.0	1,514.8	4,905.9	539.5	452.7	626.2
Puebla	Zapotlán	21209	41.0	2.7	183.6	563.8	73.8	51.9	584.0
Puebla	Zapotlán de Méndez	21210	23.6	2.0	136.9	480.0	56.8	49.8	77.8
Puebla	Zaragoza	21211	92.0	9.1	241.3	657.8	62.1	49.6	181.0
Puebla	Zautla	21212	100.4	7.4	541.5	1,851.1	210.8	187.9	109.5
Puebla	Zihuateutla	21213	63.2	4.4	411.2	1,502.4	178.1	161.9	254.6
Puebla	Zinacatepec	21214	78.7	6.6	309.5	958.6	94.0	89.6	914.8
Puebla	Zongozotla	21215	18.6	1.7	92.3	302.2	34.6	29.2	48.7
Puebla	Zoquiapan	21216	13.9	1.1	90.9	320.6	40.6	35.0	61.2
Puebla	Zoquitlán	21217	91.3	7.6	585.2	2,188.2	260.3	230.7	120.3
Puebla Total			36,109.1	18,133.5	129,346.5	361,072.7	37,690.5	30,261.3	61,225.3
Querétaro	Amealco de Bonfil	22001	498.6	37.1	1,289.2	4,265.9	594.4	444.1	1,108.7
Querétaro	Pinal de Amoles	22002	147.1	9.0	692.3	2,401.1	255.1	232.8	343.5
Querétaro	Arroyo Seco	22003	69.3	4.7	308.2	1,011.8	116.9	101.2	331.3
Querétaro	Cadereyta de Montes	22004	301.9	141.0	1,111.0	3,133.9	556.5	397.2	659.0
Querétaro	Colón	22005	319.0	72.9	830.1	2,308.2	288.0	193.6	1,349.4
Querétaro	Corregidora	22006	425.5	322.4	1,264.5	2,314.6	173.8	116.3	842.5
Querétaro	Ezequiel Montes	22007	314.7	380.2	552.0	1,227.4	850.1	540.4	909.4
Querétaro	Huimilpan	22008	162.2	20.1	523.9	1,573.9	215.4	140.6	476.9
Querétaro	Jalpan de Serra	22009	121.3	15.8	519.5	1,621.8	177.1	155.2	414.7
Querétaro	Landa de Matamoros	22010	107.0	5.5	483.1	1,578.0	184.0	158.5	335.3
Querétaro	El Marqués	22011	622.3	296.3	1,845.0	2,999.5	455.0	307.1	2,107.3
Querétaro	Pedro Escobedo	22012	1,084.2	495.6	1,349.6	2,251.1	350.0	247.1	992.2
Querétaro	Peñamiller	22013	87.6	5.6	358.9	1,130.5	122.8	107.0	223.5
Querétaro	Querétaro	22014	6,769.6	4,644.1	17,291.3	41,420.0	1,776.1	1,416.6	1,826.8

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Querétaro	San Joaquín	22015	40.7	5.1	179.3	595.1	63.3	55.9	450.1
Querétaro	San Juan del Río	22016	1,608.3	2,080.5	4,490.4	6,215.2	947.7	666.9	1,683.8
Querétaro	Tequisquiapan	22017	347.4	133.3	819.8	1,761.6	167.5	109.7	895.6
Querétaro	Tolimán	22018	131.7	47.5	435.9	1,405.8	231.3	181.0	462.6
Querétaro Total			13,158.3	8,716.6	34,344.0	79,215.3	7,524.8	5,571.1	15,412.7
Quintana Roo	Cozumel	23001	946.7	279.5	963.5	1,691.8	114.1	107.0	94.8
Quintana Roo	Felipe Carrillo Puerto	23002	2,435.7	89.4	1,985.4	7,252.2	1,041.0	849.8	483.2
Quintana Roo	Isla Mujeres	23003	250.1	24.0	195.7	611.5	54.2	49.0	50.2
Quintana Roo	Othón P. Blanco	23004	2,254.1	1,074.6	5,576.7	19,770.7	2,948.3	1,953.9	2,248.6
Quintana Roo	Benito Juárez	23005	5,337.6	1,461.0	8,059.0	25,878.4	777.4	677.9	792.7
Quintana Roo	José María Morelos	23006	465.2	57.3	1,141.3	4,190.0	575.9	481.8	464.3
Quintana Roo	Lázaro Cárdenas	23007	176.7	20.5	851.7	3,444.0	450.0	378.0	603.7
Quintana Roo	Solidaridad	23008	380.5	129.7	1,082.7	2,739.5	259.8	220.0	159.1
Quintana Roo Total			12,246.6	3,136.0	19,856.0	65,578.0	6,220.8	4,717.2	4,896.6
San Luis Potosí	Ahuatlulco	24001	224.4	8.3	359.1	1,200.2	134.4	108.5	283.0
San Luis Potosí	Alaquines	24002	83.5	3.0	187.1	605.3	89.5	64.4	214.7
San Luis Potosí	Aquismón	24003	222.4	15.6	1,563.0	5,850.3	705.5	646.3	697.8
San Luis Potosí	Armadillo de los Infante	24004	31.2	1.4	108.9	370.9	50.0	36.9	266.4
San Luis Potosí	Cárdenas	24005	169.2	15.3	286.1	716.3	76.1	55.1	275.7
San Luis Potosí	Catorce	24006	154.3	4.9	197.1	637.5	99.1	63.9	361.0
San Luis Potosí	Cedral	24007	155.8	8.1	306.7	773.2	143.1	73.4	302.2
San Luis Potosí	Cerritos	24008	144.1	16.5	354.0	858.9	126.6	76.6	602.5
San Luis Potosí	Cerro de San Pedro	24009	13.7	0.7	46.2	145.9	14.7	9.8	97.3
San Luis Potosí	Ciudad del Maíz	24010	292.3	14.7	632.0	2,032.8	265.1	207.8	2,545.9
San Luis Potosí	Ciudad Fernández	24011	389.6	20.6	719.2	1,932.1	239.1	184.7	359.2
San Luis Potosí	Tancanhuitz de Santos	24012	107.4	9.2	682.2	2,645.7	312.9	286.4	313.3
San Luis Potosí	Ciudad Valles	24013	2,274.6	3,292.9	4,130.7	13,693.9	3,760.6	2,262.5	1,646.5
San Luis Potosí	Coxcatlán	24014	90.1	7.3	642.8	2,511.2	300.5	274.1	179.3
San Luis Potosí	Charcas	24015	225.4	12.6	373.0	1,107.9	181.3	107.6	378.4
San Luis Potosí	Ebano	24016	498.9	29.6	805.4	2,150.8	424.2	250.0	716.0
San Luis Potosí	Guadalcázar	24017	220.2	7.8	573.0	1,877.7	292.6	196.5	1,122.9
San Luis Potosí	Huehuetlán	24018	74.8	5.0	507.3	1,839.8	215.5	200.4	230.7
San Luis Potosí	Lagunillas	24019	43.7	2.1	155.1	510.6	76.1	55.9	323.9
San Luis Potosí	Matehuala	24020	398.4	71.3	1,365.9	2,662.2	227.6	142.4	475.1
San Luis Potosí	Mexquitic de Carmona	24021	455.1	13.0	856.6	2,789.2	283.1	236.8	457.3
San Luis Potosí	Moctezuma	24022	260.4	8.2	370.2	1,199.1	161.6	116.2	650.8
San Luis Potosí	Rayón	24023	207.2	7.5	340.1	987.9	178.4	113.1	342.6
San Luis Potosí	Ríoverde	24024	712.6	71.3	2,132.2	7,182.2	808.7	677.1	1,025.6

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State Name	Municipality Name	State/ Municipality Code	NO_x	SO_x	VOC	CO	PM₁₀	PM_{2.5}	NH₃
San Luis Potosí	Salinas	24025	462.6	19.2	458.8	1,226.2	278.8	138.3	957.3
San Luis Potosí	San Antonio	24026	49.2	3.5	363.3	1,454.0	182.1	161.1	154.6
San Luis Potosí	San Ciro de Acosta	24027	45.8	6.8	208.2	582.2	105.1	61.0	210.7
San Luis Potosí	San Luis Potosí	24028	6,826.3	9,526.3	17,110.7	47,805.1	2,053.4	1,555.3	2,137.3
San Luis Potosí	San Martín Chalchicuautla	24029	123.9	8.5	801.6	3,001.7	356.1	333.0	536.7
San Luis Potosí	San Nicolás Tolentino	24030	35.8	1.8	134.0	451.0	46.7	39.5	151.2
San Luis Potosí	Santa Catarina	24031	62.3	3.4	327.1	1,201.9	150.6	132.1	247.4
San Luis Potosí	Santa María del Río	24032	181.6	17.7	789.7	2,640.4	256.4	225.9	502.7
San Luis Potosí	Santo Domingo	24033	598.7	9.9	319.7	958.8	389.0	184.5	918.6
San Luis Potosí	San Vicente Tancuayalab	24034	99.2	6.5	419.0	1,510.9	186.4	156.5	708.9
San Luis Potosí	Soledad de Graciano Sánchez	24035	1,451.6	189.7	3,135.0	12,762.6	327.3	236.2	1,520.8
San Luis Potosí	Tamasopo	24036	317.1	142.3	1,070.3	4,089.9	1,122.3	623.8	521.2
San Luis Potosí	Tamazunchale	24037	474.2	48.2	2,805.9	9,977.4	1,147.5	1,072.1	312.0
San Luis Potosí	Tampacán	24038	95.3	6.0	539.3	2,018.9	236.7	222.2	479.4
San Luis Potosí	Tampamolón Corona	24039	74.4	5.5	502.0	1,918.3	238.3	212.2	422.4
San Luis Potosí	Tamuín	24040	1,300.7	1,476.2	872.6	2,717.8	1,060.6	694.3	2,171.8
San Luis Potosí	Tanlajás	24041	113.4	7.2	706.3	2,902.9	368.1	318.8	359.5
San Luis Potosí	Tanquián de Escobedo	24042	75.9	8.8	397.7	1,323.0	149.8	139.1	442.4
San Luis Potosí	Tierra Nueva	24043	41.1	4.2	173.1	530.2	50.6	43.1	254.7
San Luis Potosí	Vanegas	24044	251.3	5.0	174.6	527.7	109.8	61.7	271.0
San Luis Potosí	Venado	24045	250.9	8.2	293.0	916.3	168.9	99.3	363.3
San Luis Potosí	Villa de Arriaga	24046	371.7	9.5	319.7	937.1	295.9	145.8	856.9
San Luis Potosí	Villa de Guadalupe	24047	71.2	3.1	222.9	692.2	134.0	75.5	358.4
San Luis Potosí	Villa de la Paz	24048	24.7	2.6	93.4	195.9	16.2	11.1	35.2
San Luis Potosí	Villa de Ramos	24049	1,977.7	35.7	895.7	2,824.6	971.5	525.7	1,779.6
San Luis Potosí	Villa de Reyes	24050	5,930.6	70,066.8	1,892.3	2,862.2	3,506.0	2,542.1	965.0
San Luis Potosí	Villa Hidalgo	24051	287.5	8.2	311.2	951.5	152.3	101.7	696.4
San Luis Potosí	Villa Juárez	24052	243.6	6.5	251.9	738.7	154.4	97.0	377.8
San Luis Potosí	Axtla de Terrazas	24053	164.0	15.8	1,039.5	3,855.0	443.1	419.3	382.1
San Luis Potosí	Xilitla	24054	244.1	20.4	1,554.0	5,543.5	632.8	593.6	305.6
San Luis Potosí	Zaragoza	24055	95.1	7.0	375.7	1,310.8	119.7	104.7	233.5
San Luis Potosí	Villa de Arista	24056	91.7	6.6	227.2	724.0	80.3	59.5	230.3
San Luis Potosí	Matlapa	24057	109.1	8.8	287.5	669.7	29.6	19.7	224.8
San Luis Potosí	El Naranjo	24058	240.3	114.1	747.9	2,701.2	983.1	486.3	432.6
San Luis Potosí Total			30,231.9	85,456.5	57,514.9	180,805.0	25,669.3	18,338.0	34,390.1
Sinaloa	Ahome	25001	7,748.8	32,846.1	7,054.3	18,422.5	4,356.7	2,482.6	3,347.6
Sinaloa	Angostura	25002	941.0	30.1	877.2	2,687.7	822.5	389.3	1,650.1
Sinaloa	Badiraguato	25003	330.7	14.0	1,050.7	3,594.1	575.4	411.2	9,040.4

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Sinaloa	Concordia	25004	269.1	11.3	651.9	1,978.8	272.9	205.2	2,354.1
Sinaloa	Cosalá	25005	116.3	7.9	448.5	1,421.3	231.6	160.3	1,600.1
Sinaloa	Culiacán	25006	7,559.4	1,659.8	15,307.6	43,977.0	3,464.2	2,031.4	11,195.8
Sinaloa	Choix	25007	319.0	13.6	747.3	2,468.5	308.3	257.7	2,750.9
Sinaloa	Elota	25008	587.8	25.6	993.3	2,926.8	532.7	328.3	1,227.5
Sinaloa	Escuinapa	25009	853.7	38.3	895.0	2,250.7	345.7	236.3	1,717.6
Sinaloa	El Fuerte	25010	1,387.3	3,142.8	1,808.9	5,439.2	934.7	655.6	3,394.2
Sinaloa	Guasave	25011	2,625.9	261.1	4,209.0	10,349.3	2,007.2	1,011.0	2,025.6
Sinaloa	Mazatlán	25012	10,998.0	67,009.9	8,036.8	22,433.9	4,452.5	2,982.2	3,083.3
Sinaloa	Mocorito	25013	905.2	25.3	1,165.1	3,465.9	806.7	458.4	3,245.5
Sinaloa	Rosario	25014	531.8	34.9	883.8	2,378.6	978.7	420.2	2,854.4
Sinaloa	Salvador Alvarado	25015	824.1	86.4	1,482.7	2,536.5	542.6	254.2	998.5
Sinaloa	San Ignacio	25016	288.8	12.8	626.1	1,886.2	334.2	214.2	3,665.3
Sinaloa	Sinaloa	25017	1,103.9	34.0	1,951.3	6,952.0	1,090.3	775.9	4,339.5
Sinaloa	Navolato	25018	1,555.8	277.1	2,424.7	6,274.0	1,534.4	781.1	3,637.5
Sinaloa Total			38,946.2	105,531.1	50,614.2	141,443.0	23,591.4	14,055.1	62,127.8
Sonora	Aconchi	26001	17.5	1.4	56.2	95.9	9.1	6.7	178.2
Sonora	Agua Prieta	26002	846.6	679.9	1,610.4	2,410.3	179.2	137.8	623.5
Sonora	Alamos	26003	200.1	12.7	687.1	2,111.3	295.1	226.1	2,384.0
Sonora	Altar	26004	72.8	9.5	130.2	399.9	41.1	32.8	667.8
Sonora	Arivechi	26005	12.5	0.5	30.7	83.9	8.6	7.4	357.6
Sonora	Arizpe	26006	39.6	1.8	84.1	195.4	21.7	18.4	791.0
Sonora	Atil	26007	6.1	0.5	12.1	30.0	2.5	2.1	68.3
Sonora	Bacadéhuachi	26008	10.1	0.5	27.7	75.5	7.4	6.5	321.6
Sonora	Bacanora	26009	6.2	0.3	21.8	53.3	5.6	4.7	400.2
Sonora	Bacerac	26010	9.2	0.7	31.5	100.6	11.7	9.8	292.3
Sonora	Bacoachi	26011	12.4	0.7	31.0	72.2	8.1	6.2	458.2
Sonora	Bácum	26012	317.1	10.1	634.4	4,040.8	564.7	433.6	368.2
Sonora	Banámichi	26013	19.6	0.8	33.2	59.8	6.5	5.0	296.1
Sonora	Baviácora	26014	32.2	1.9	76.7	133.8	12.9	9.1	580.2
Sonora	Bavispe	26015	27.3	0.7	30.3	99.3	14.0	11.1	314.7
Sonora	Benjamín Hill	26016	1,070.6	12.4	149.6	288.0	36.4	32.6	328.6
Sonora	Caborca	26017	1,013.9	129.4	1,157.0	2,477.4	15,594.6	4,660.4	848.8
Sonora	Cajeme	26018	4,075.0	1,852.6	8,781.4	26,980.1	2,300.8	1,775.4	4,497.6
Sonora	Cananea	26019	766.4	2,303.8	587.1	1,190.4	3,608.7	1,081.9	806.7
Sonora	Carbó	26020	141.5	2.8	77.0	170.4	13.8	11.1	852.2
Sonora	La Colorada	26021	137.3	41.5	50.1	116.7	599.5	182.0	1,008.6
Sonora	Cucurpe	26022	24.5	0.5	22.5	57.2	8.5	6.8	566.2

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Sonora	Cumpas	26023	61.2	11,931.0	105.9	225.8	24.0	16.7	731.5
Sonora	Divisaderos	26024	16.5	0.5	15.3	37.2	4.1	3.6	211.6
Sonora	Empalme	26025	519.3	28.5	1,060.7	1,735.5	125.9	103.3	300.7
Sonora	Etchojoa	26026	685.3	32.4	1,410.3	7,127.8	901.9	733.5	461.2
Sonora	Fronteras	26027	251.9	5.7	166.5	332.5	39.1	30.1	778.0
Sonora	Granados	26028	11.8	0.6	18.5	40.5	4.3	2.8	138.1
Sonora	Guaymas	26029	7,410.3	57,446.2	3,478.1	8,911.2	4,330.2	4,115.6	1,938.1
Sonora	Hermosillo	26030	8,545.6	14,148.5	15,035.9	38,141.7	2,148.3	1,523.4	5,023.6
Sonora	Huachinera	26031	9.5	0.5	30.5	84.9	9.7	8.3	330.7
Sonora	Huásabas	26032	8.9	0.4	18.7	31.8	4.2	2.3	238.1
Sonora	Huatabampo	26033	781.7	45.6	1,545.8	5,090.1	541.0	448.7	717.4
Sonora	Huépac	26034	7.3	0.4	21.5	34.2	3.2	1.9	167.5
Sonora	Imuris	26035	159.9	5.2	187.2	333.0	23.3	19.5	483.7
Sonora	Magdalena	26036	241.4	20.1	551.9	694.3	36.7	30.0	495.4
Sonora	Mazatlán	26037	21.4	1.1	33.1	64.6	5.7	5.2	312.6
Sonora	Moctezuma	26038	44.7	3.2	120.4	297.5	29.8	25.0	517.4
Sonora	Naco	26039	153.8	5.3	153.7	193.8	10.1	9.1	224.5
Sonora	Nácori Chico	26040	39.0	2.3	179.1	875.3	100.6	89.6	775.8
Sonora	Nacozari de García	26041	1,197.2	2,817.5	275.4	484.3	2,612.2	773.6	305.5
Sonora	Navojoa	26042	1,383.9	784.9	3,208.1	10,691.2	1,295.7	1,018.1	3,304.5
Sonora	Nogales	26043	1,879.8	188.4	5,233.7	9,041.5	202.8	168.6	684.0
Sonora	Onavas	26044	6.1	0.2	11.9	30.6	3.1	2.9	153.1
Sonora	Opodepe	26045	93.9	1.6	63.5	159.5	17.7	14.8	663.9
Sonora	Oquitoa	26046	23.7	0.4	11.9	43.3	6.6	5.9	140.2
Sonora	Pitiquito	26047	4,645.8	66,901.9	259.2	1,007.7	4,181.0	4,102.5	975.6
Sonora	Puerto Peñasco	26048	525.4	44.2	567.6	801.4	34.5	31.7	232.3
Sonora	Quiriego	26049	55.7	1.6	106.4	344.2	55.0	41.5	886.3
Sonora	Rayón	26050	13.0	0.7	31.3	100.0	13.6	9.3	398.6
Sonora	Rosario	26051	43.8	2.5	143.0	417.4	55.9	43.3	784.8
Sonora	Sahuaripa	26052	48.3	3.2	124.4	319.6	31.3	26.4	1,459.5
Sonora	San Felipe de Jesús	26053	4.0	0.1	7.1	13.6	1.6	1.0	47.0
Sonora	San Javier	26054	1.8	0.2	10.5	16.0	1.4	1.3	146.0
Sonora	San Luis Río Colorado	26055	2,204.2	155.4	3,510.7	10,778.0	584.0	472.5	528.3
Sonora	San Miguel de Horcasitas	26056	120.9	4.5	108.4	335.5	37.0	32.4	517.5
Sonora	San Pedro de la Cueva	26057	15.3	0.7	33.2	72.6	6.1	5.4	509.8
Sonora	Santa Ana	26058	210.5	62.5	323.8	426.9	32.5	24.0	510.2
Sonora	Santa Cruz	26059	207.2	2.6	42.1	128.6	20.3	19.0	302.1
Sonora	Sáric	26060	35.3	1.0	41.3	112.1	11.5	10.2	386.4

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Sonora	Soyopa	26061	19.1	0.5	39.8	122.9	12.4	11.6	389.8
Sonora	Suaqui Grande	26062	28.7	0.6	21.9	59.5	7.3	6.5	283.0
Sonora	Tepache	26063	9.5	0.6	23.9	47.9	2.9	2.4	259.4
Sonora	Trincheras	26064	146.6	1.9	43.8	186.8	28.8	20.5	557.9
Sonora	Tubutama	26065	35.4	0.8	41.3	120.7	14.7	12.6	311.5
Sonora	Ures	26066	78.0	4.0	156.4	376.1	35.9	26.2	1,089.5
Sonora	Villa Hidalgo	26067	22.4	0.7	66.3	271.2	29.6	25.5	363.3
Sonora	Villa Pesqueira	26068	22.8	0.6	33.5	68.4	6.2	5.8	564.8
Sonora	Yécora	26069	53.5	7.2	204.4	741.7	79.7	71.8	985.0
Sonora	General Plutarco elías Calles	26070	101.1	24.0	178.3	351.8	25.4	18.5	347.8
Sonora	Benito Juárez	26071	134.4	11.7	498.0	3,042.9	389.9	297.9	39.7
Sonora	San Ignacio Río Muerto	26072	83.5	5.7	311.0	1,925.1	274.8	194.9	171.2
Sonora Total			41,278.6	159,775.0	54,187.3	148,132.7	41,803.7	23,335.3	49,155.1
Tabasco	Balancán	27001	716.8	38.4	1,359.2	4,391.3	694.6	504.9	6,623.8
Tabasco	Cárdenas	27002	2,197.0	2,793.7	10,064.5	13,947.8	3,281.1	1,681.7	3,210.7
Tabasco	Centla	27003	451.7	58.4	1,797.4	6,143.7	627.9	558.0	1,234.0
Tabasco	Centro	27004	8,933.0	72,711.8	12,206.2	46,748.5	13,055.4	7,670.6	3,550.7
Tabasco	Comalcalco	27005	927.7	445.2	4,859.6	9,795.7	984.6	896.1	1,058.2
Tabasco	Cunduacán	27006	2,601.2	188.5	7,096.5	7,608.7	1,908.9	1,623.6	1,830.2
Tabasco	Emiliano Zapata	27007	296.1	95.1	506.4	1,394.6	179.4	138.7	1,162.1
Tabasco	Huimanguillo	27008	1,611.5	941.4	6,306.0	12,349.9	2,064.8	1,566.2	3,921.0
Tabasco	Jalapa	27009	150.6	16.4	592.9	1,774.9	190.3	157.2	2,174.3
Tabasco	Jalpa de Méndez	27010	316.9	57.5	1,659.6	4,028.5	401.0	362.6	943.2
Tabasco	Jonuta	27011	146.0	16.7	631.7	2,021.7	268.7	208.0	2,597.4
Tabasco	Macuspana	27012	1,602.8	70,250.0	2,727.9	6,994.3	2,718.6	1,745.6	4,348.9
Tabasco	Nacajuca	27013	374.2	38.4	1,209.3	3,704.6	286.7	256.0	908.3
Tabasco	Paraíso	27014	7,140.1	353.7	1,425.3	4,926.8	587.2	543.1	375.9
Tabasco	Tacotalpa	27015	366.8	305.3	1,371.4	4,729.1	921.8	630.2	1,631.6
Tabasco	Teapa	27016	282.3	54.7	3,344.5	2,316.4	227.0	196.8	1,312.8
Tabasco	Tenosique	27017	690.0	470.8	1,417.5	4,661.6	820.2	566.4	3,958.1
Tabasco Total			28,805.0	148,835.9	58,576.0	137,538.0	29,218.3	19,305.6	40,841.1
Tamaulipas	Abasolo	28001	395.8	12.4	664.6	642.7	257.2	113.9	727.9
Tamaulipas	Aldama	28002	549.0	20.5	611.6	1,696.2	329.3	203.5	6,451.7
Tamaulipas	Altamira	28003	9,466.5	91,794.0	2,762.8	7,054.5	946.5	636.7	1,988.9
Tamaulipas	Antiguo Morelos	28004	124.1	30.8	285.6	1,195.9	161.8	122.6	244.1
Tamaulipas	Burgos	28005	171.8	3.6	119.8	372.4	88.2	52.5	1,198.6
Tamaulipas	Bustamante	28006	53.4	2.5	194.4	662.5	133.8	77.7	352.1
Tamaulipas	Camargo	28007	336.5	13.2	494.6	578.0	94.7	49.1	277.7

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Tamaulipas	Casas	28008	175.4	2.9	161.0	426.3	183.2	78.8	962.3
Tamaulipas	Ciudad Madero	28009	5,947.8	38,941.9	29,465.3	19,015.0	2,504.7	1,674.4	220.6
Tamaulipas	Cruillas	28010	33.4	0.9	45.2	94.0	31.0	12.6	467.0
Tamaulipas	Gómez Farías	28011	108.0	4.4	286.5	1,321.7	178.1	127.5	157.8
Tamaulipas	González	28012	1,089.8	35.4	1,001.8	2,853.4	701.9	387.3	2,169.9
Tamaulipas	Güémez	28013	283.7	7.2	335.0	974.3	162.7	115.8	531.3
Tamaulipas	Guerrero	28014	41.3	3.1	75.0	121.4	14.9	7.3	892.3
Tamaulipas	Gustavo Díaz Ordaz	28015	299.0	13.6	401.6	518.8	91.3	50.3	148.4
Tamaulipas	Hidalgo	28016	539.0	16.1	565.2	1,553.6	297.9	191.2	833.2
Tamaulipas	Jaumave	28017	112.3	6.2	336.0	1,004.5	145.1	108.0	534.0
Tamaulipas	Jiménez	28018	77.6	4.8	153.7	333.6	93.5	38.2	625.8
Tamaulipas	Llera	28019	466.6	10.6	453.7	1,376.8	244.2	172.7	832.3
Tamaulipas	Mainero	28020	59.3	1.4	70.2	213.3	48.2	28.8	179.7
Tamaulipas	El Mante	28021	1,882.3	1,813.2	2,509.0	6,303.8	1,551.4	871.0	1,023.2
Tamaulipas	Matamoros	28022	6,349.9	926.1	11,646.0	25,897.3	1,713.0	1,117.0	1,503.0
Tamaulipas	Méndez	28023	210.0	3.8	182.4	283.1	298.6	94.3	673.1
Tamaulipas	Mier	28024	41.3	6.5	109.8	264.9	12.1	6.3	451.9
Tamaulipas	Miguel Alemán	28025	161.7	29.8	410.1	636.3	44.2	25.0	269.3
Tamaulipas	Miquihuana	28026	33.2	1.4	115.2	440.5	78.4	50.6	216.0
Tamaulipas	Nuevo Laredo	28027	4,843.1	434.7	9,050.5	20,148.4	672.6	500.8	702.2
Tamaulipas	Nuevo Morelos	28028	38.9	1.4	107.0	534.6	73.3	52.0	145.5
Tamaulipas	Ocampo	28029	163.6	7.0	430.7	1,735.2	257.3	182.6	670.4
Tamaulipas	Padilla	28030	324.0	9.7	288.8	720.1	153.4	93.9	366.9
Tamaulipas	Palmillas	28031	15.3	1.0	53.4	131.6	22.2	14.6	119.7
Tamaulipas	Reynosa	28032	5,603.7	1,066.4	11,424.1	27,546.1	1,330.3	879.1	1,128.9
Tamaulipas	Río Bravo	28033	3,876.7	17,178.7	2,310.7	3,767.2	2,090.4	1,478.7	344.8
Tamaulipas	San Carlos	28034	124.5	3.6	231.2	658.2	169.2	87.9	824.3
Tamaulipas	San Fernando	28035	1,788.8	49.3	1,370.8	2,557.6	1,369.5	538.1	1,290.7
Tamaulipas	San Nicolás	28036	6.5	0.3	23.6	79.9	8.5	7.7	86.4
Tamaulipas	Soto la Marina	28037	447.1	16.5	486.3	1,235.5	248.8	144.5	4,584.3
Tamaulipas	Tampico	28038	5,870.4	904.0	5,521.7	17,898.3	444.5	373.4	315.7
Tamaulipas	Tula	28039	202.0	13.6	603.4	1,805.4	301.8	196.4	860.6
Tamaulipas	Valle Hermoso	28040	984.4	61.1	1,512.2	1,818.1	439.2	210.8	255.9
Tamaulipas	Victoria	28041	2,470.6	348.7	4,930.2	13,570.8	486.0	390.4	789.9
Tamaulipas	Villagrán	28042	212.9	4.1	170.6	487.2	115.8	65.0	789.5
Tamaulipas	Xicoténcatl	28043	610.9	1,461.0	875.1	2,989.2	1,094.5	566.8	306.4
Tamaulipas Total			56,592.1	155,267.3	92,846.7	173,518.1	19,683.4	12,195.7	37,514.0
Tlaxcala	Amaxac de Guerrero	29001	55.9	9.8	155.1	598.5	21.2	15.8	43.5

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Tlaxcala	Apetatitlán de Antonio Carvajal	29002	78.6	104.6	300.0	663.8	30.1	20.7	42.7
Tlaxcala	Atlangatepec	29003	157.4	380.0	126.9	359.6	107.3	61.7	285.3
Tlaxcala	Altzayanca	29004	184.2	11.0	304.4	881.1	143.8	94.7	224.0
Tlaxcala	Apizaco	29005	488.5	210.9	1,601.3	3,996.1	97.7	68.1	411.1
Tlaxcala	Calpulalpan	29006	940.8	1,119.5	1,419.9	5,169.4	683.5	557.5	489.7
Tlaxcala	El Carmen Tequexquitla	29007	96.5	11.3	243.0	616.7	54.0	44.6	77.2
Tlaxcala	Cuapiaxtla	29008	94.0	6.2	220.6	611.4	129.6	62.8	209.3
Tlaxcala	Cuaxomulco	29009	36.1	3.8	90.4	314.6	28.1	18.4	85.8
Tlaxcala	Chiautempan	29010	430.4	350.0	1,478.4	3,847.1	151.5	107.5	184.0
Tlaxcala	Muñoz de Domingo Arenas	29011	209.2	13.1	117.0	355.9	69.2	48.4	212.4
Tlaxcala	Espaňita	29012	165.0	6.8	266.3	1,093.5	150.4	117.5	230.0
Tlaxcala	Huamantla	29013	609.4	156.8	1,428.3	3,204.3	427.9	270.3	860.2
Tlaxcala	Hueyotlipan	29014	372.9	16.7	379.9	1,377.0	207.0	156.5	272.6
Tlaxcala	Ixtacuixtla de Mariano Matamoros	29015	200.8	221.2	852.9	1,467.5	174.3	113.8	218.3
Tlaxcala	Ixtenco	29016	88.1	5.3	121.5	331.5	42.9	31.2	60.4
H-55	Mazatecochco de José María Morelos	29017	66.8	14.1	210.4	790.9	40.2	34.8	30.8
	Contla de Juan Cuamatzi	29018	211.9	54.0	687.4	2,476.1	135.0	116.3	104.9
	Tepetitla de Lardizábal	29019	83.9	103.9	358.1	495.2	36.9	25.8	78.7
	Sanctórum de Lázaro Cárdenas	29020	294.0	7.4	167.9	519.0	106.8	72.4	340.4
	Nanacamilpa de Mariano Arista	29021	277.7	36.7	366.0	980.5	136.3	97.2	296.6
	Acuamanala de Miguel Hidalgo	29022	32.3	18.7	109.8	305.7	20.1	13.7	18.7
	Nativitas	29023	161.2	14.3	370.6	1,075.1	76.4	50.6	164.6
	Panotla	29024	130.3	21.8	461.2	1,380.7	79.2	59.4	118.5
	San Pablo del Monte	29025	208.1	67.7	995.1	2,527.2	183.5	163.0	115.4
	Santa Cruz Tlaxcala	29026	107.6	15.8	263.4	855.6	46.5	32.3	89.0
	Tenancingo	29027	77.6	8.9	216.2	850.2	35.1	27.9	33.1
	Teolocholco	29028	179.3	115.8	876.7	1,403.7	93.0	64.3	124.1
	Tepeyanco	29029	44.9	3.2	159.1	434.2	23.0	14.1	31.3
	Terrenate	29030	207.9	6.4	286.5	941.8	173.7	111.7	193.6
	Tetla de la Solidaridad	29031	298.1	257.2	797.5	1,468.6	162.1	95.0	277.1
	Tetlatlahuca	29032	109.9	18.3	217.1	739.2	41.8	24.2	156.2
	Tlaxcala	29033	610.0	598.6	1,895.4	5,216.1	112.7	89.5	128.1
	Tlaxco	29034	678.0	83.3	879.3	2,376.1	391.1	264.2	715.8
	Tocatlán	29035	88.2	4.6	109.4	441.7	31.3	23.6	36.3
	Totolac	29036	84.3	20.7	283.4	720.8	17.4	14.2	81.4
	Zitlaltepec de Trinidad Sánchez Santo	29037	66.2	6.2	201.9	636.8	93.1	65.0	87.3

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Tlaxcala	Tzompantepec	29038	110.6	31.5	250.1	501.7	65.3	38.0	77.0
Tlaxcala	Xaloztoc	29039	190.1	73.1	444.9	1,436.7	91.1	62.2	110.2
Tlaxcala	Xaltocan	29040	45.4	7.6	163.3	484.3	73.0	43.2	118.2
Tlaxcala	Papalotla de Xicohténcatl	29041	232.5	376.0	757.6	1,540.3	73.1	49.1	82.2
Tlaxcala	Xicotzingo	29042	143.9	659.5	574.0	766.4	78.4	46.1	40.9
Tlaxcala	Yauhquemecan	29043	128.5	52.2	537.8	1,152.3	88.9	63.5	123.5
Tlaxcala	Zacatelco	29044	285.2	65.5	722.6	2,391.3	74.2	55.4	75.8
Tlaxcala	Benito Juárez	29045	45.2	2.9	67.0	154.3	6.5	5.4	166.3
Tlaxcala	Emiliano Zapata	29046	16.0	5.4	100.6	328.4	32.7	31.1	24.6
Tlaxcala	Lázaro Cárdenas	29047	9.1	1.6	36.5	92.4	4.9	4.5	31.5
Tlaxcala	La Magdalena Tlaltelulco	29048	119.1	60.8	355.9	1,150.8	40.4	37.3	34.4
Tlaxcala	San Damián Texoloc	29049	34.2	25.2	83.8	316.7	7.4	6.3	40.9
Tlaxcala	San Francisco Tetlanohcan	29050	71.1	9.3	218.7	882.4	40.1	37.7	28.2
Tlaxcala	San Jerónimo Zacualpan	29051	24.0	2.9	60.7	234.5	4.4	3.8	38.2
Tlaxcala	San José Teacalco	29052	51.4	2.5	87.6	261.4	25.3	22.2	48.0
Tlaxcala	San Juan Huactzinco	29053	45.4	47.8	162.5	395.5	8.4	7.0	18.4
Tlaxcala	San Lorenzo Axocomanitla	29054	32.4	4.5	80.8	315.8	5.3	4.8	14.3
Tlaxcala	San Lucas Tecopilco	29055	11.7	4.0	50.5	120.1	6.8	6.3	64.8
Tlaxcala	Santa Ana Nopalucan	29056	24.4	14.6	100.6	248.8	15.0	14.0	17.2
Tlaxcala	Santa Apolonia Teacalco	29057	27.4	3.0	72.7	281.0	6.7	6.2	20.9
Tlaxcala	Santa Catarina Ayometla	29058	59.0	5.9	136.4	539.1	12.7	11.9	15.8
Tlaxcala	Santa Cruz Quilehtla	29059	32.8	13.0	105.1	335.1	11.0	10.2	11.8
Tlaxcala	Santa Isabel Xiloxoxtla	29060	45.0	57.5	150.0	261.0	11.6	10.1	9.9
Tlaxcala Total			10,010.0	5,631.1	24,337.9	65,713.8	5,336.8	3,825.6	8,341.5
Veracruz	Acajete	30001	52.1	2.2	165.9	611.7	63.5	58.4	170.7
Veracruz	Acatlán	30002	10.0	1.3	54.9	135.5	14.5	11.0	46.8
Veracruz	Acayucan	30003	369.9	77.3	1,586.6	4,729.1	572.5	447.9	1,403.0
Veracruz	Actopan	30004	225.6	11.8	844.1	2,945.7	364.1	274.5	592.5
Veracruz	Acula	30005	23.3	1.5	93.3	407.3	47.6	32.9	206.6
Veracruz	Acultzingo	30006	154.9	6.4	388.9	1,311.8	163.0	128.8	163.0
Veracruz	Camarón de Tejeda	30007	86.2	2.7	190.2	776.1	108.9	82.7	950.8
Veracruz	Alpatláhuac	30008	36.6	2.9	220.8	827.9	100.6	85.8	66.6
Veracruz	Alto Lucero de Gutiérrez Barrios	30009	112.0	9.8	538.6	1,733.7	212.7	167.7	509.5
Veracruz	Altotonga	30010	228.6	23.3	1,387.0	4,485.5	500.9	440.4	283.4
Veracruz	Alvarado	30011	283.0	28.2	679.1	1,497.3	96.1	78.9	1,293.5
Veracruz	Amatitlán	30012	49.6	1.9	142.9	687.7	84.4	56.2	261.1
Veracruz	Naranjos Amatlán	30013	104.3	23.0	478.8	1,405.8	133.6	119.5	224.2
Veracruz	Amatlán de los Reyes	30014	254.6	229.4	819.8	2,724.5	283.8	242.4	846.3

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Veracruz	Angel R. Cabada	30015	194.9	17.8	757.4	2,894.3	347.1	268.5	254.2
Veracruz	La Antigua	30016	368.3	751.5	957.1	1,633.5	957.3	430.6	120.4
Veracruz	Apazapan	30017	31.9	1.5	101.8	357.6	53.6	40.6	47.7
Veracruz	Aquila	30018	7.7	0.6	48.6	183.0	23.4	19.5	25.5
Veracruz	Astacinga	30019	23.4	1.9	148.0	558.6	70.9	59.4	31.9
Veracruz	Atlahuilco	30020	35.2	2.5	227.4	853.0	99.6	89.1	75.2
Veracruz	Atoyac	30021	462.8	1,517.5	1,716.8	2,837.5	1,520.5	731.6	151.0
Veracruz	Atzacan	30022	69.9	7.2	362.1	1,417.6	157.9	130.0	252.0
Veracruz	Atzalan	30023	224.6	16.9	1,488.3	5,595.0	647.9	591.8	357.9
Veracruz	Tlaltetela	30024	64.0	4.6	412.6	1,649.6	204.7	173.1	151.9
Veracruz	Ayahualulco	30025	86.3	6.8	523.2	1,965.0	246.9	205.6	315.1
Veracruz	Banderilla	30026	75.1	10.4	207.4	491.7	22.8	19.2	55.7
Veracruz	Benito Juárez	30027	80.4	6.1	608.3	2,300.6	365.2	277.3	51.1
Veracruz	Boca del Río	30028	865.9	185.9	2,290.8	6,651.8	154.3	117.4	395.5
Veracruz	Calcahuasco	30029	47.7	3.3	293.9	1,120.3	131.5	116.1	49.3
Veracruz	Camerino Z. Mendoza	30030	285.8	35.0	771.2	2,645.6	101.6	94.9	361.7
Veracruz	Carrillo Puerto	30031	69.9	4.4	1,859.5	1,913.0	236.3	199.5	163.5
Veracruz	Catemaco	30032	216.4	26.8	1,128.4	3,811.0	437.5	389.8	1,146.4
Veracruz	Cazones de Herrera	30033	212.6	10.4	707.6	2,463.1	312.2	274.5	754.5
Veracruz	Cerro Azul	30034	95.3	19.0	417.2	1,128.8	97.9	87.4	290.2
Veracruz	Citlaltépetl	30035	52.5	5.6	366.0	1,354.8	154.2	146.8	502.0
Veracruz	Coacoatzintla	30036	29.1	2.6	145.9	514.6	53.7	47.2	276.8
Veracruz	Coahuatlán	30037	33.7	2.8	254.4	983.2	121.3	111.0	212.8
Veracruz	Coatepec	30038	503.3	1,519.5	1,448.2	3,371.9	551.8	374.5	393.3
Veracruz	Coatzacoalcos	30039	8,694.1	2,501.3	26,752.8	17,775.5	4,625.4	4,287.4	374.8
Veracruz	Coatzintla	30040	173.4	19.3	794.1	2,385.7	255.5	224.2	1,769.4
Veracruz	Coetzala	30041	8.9	0.8	67.6	265.6	32.7	29.4	588.9
Veracruz	Colipa	30042	27.9	2.7	182.4	661.7	79.0	71.3	210.7
Veracruz	Comapa	30043	81.8	6.5	578.6	2,155.8	292.2	242.5	4,466.7
Veracruz	Córdoba	30044	1,405.9	1,220.8	3,724.6	11,296.8	918.0	598.3	491.4
Veracruz	Cosamaloapan	30045	576.4	562.8	1,203.0	3,650.6	706.2	419.3	808.3
Veracruz	Cosautlán de Carvajal	30046	67.6	6.5	443.2	1,560.0	172.3	163.3	130.1
Veracruz	Coscomatepec	30047	170.7	18.1	966.0	3,251.6	357.2	311.1	210.8
Veracruz	Cosoleacaque	30048	2,162.9	1,817.5	11,707.9	6,167.7	525.9	460.3	175.1
Veracruz	Cotaxtla	30049	138.5	2,946.0	613.7	1,689.1	208.5	178.0	411.3
Veracruz	Coxquihui	30050	86.4	6.4	525.0	2,019.0	248.9	228.3	207.8
Veracruz	Coyutla	30051	117.7	11.2	752.4	2,819.4	344.7	316.1	445.8
Veracruz	Cuichapa	30052	528.1	2,972.6	903.5	1,836.6	1,364.5	637.7	788.3

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Veracruz	Cuitláhuac	30053	226.2	1,141.2	751.1	1,648.5	511.4	279.2	78.7
Veracruz	Chacaltianguis	30054	149.0	4.9	263.0	1,123.9	136.7	104.9	291.2
Veracruz	Chalma	30055	77.9	5.4	436.8	1,611.2	217.0	183.7	189.4
Veracruz	Chiconamel	30056	33.6	2.6	244.3	941.0	124.1	107.7	450.4
Veracruz	Chiconquiaco	30057	55.1	4.6	328.4	1,228.8	143.9	125.6	546.7
Veracruz	Chicontepec	30058	318.1	23.5	2,119.1	7,787.6	1,109.1	906.6	144.9
Veracruz	Chinameca	30059	108.9	6.4	310.5	948.9	110.0	96.6	266.3
Veracruz	Chinampa de Gorostiza	30060	68.9	4.5	389.6	1,384.0	158.6	146.1	347.9
Veracruz	Las Choapas	30061	397.0	42.2	1,679.2	5,490.6	772.8	583.9	1,513.7
Veracruz	Chocamán	30062	62.3	6.6	321.4	1,220.7	136.4	111.6	244.6
Veracruz	Chontla	30063	72.7	5.7	512.2	1,939.5	238.5	216.2	668.2
Veracruz	Chumatlán	30064	18.2	1.4	129.5	498.4	64.4	57.1	24.0
Veracruz	Emiliano Zapata	30065	306.5	17.7	799.7	2,445.5	250.4	211.4	322.0
Veracruz	Espinal	30066	174.7	11.2	847.7	3,116.0	394.7	354.0	515.5
Veracruz	Filomeno Mata	30067	52.5	4.6	393.4	1,522.2	179.2	169.6	541.1
Veracruz	Fortín	30068	311.7	42.1	877.7	2,687.6	162.0	144.1	206.2
Veracruz	Gutiérrez Zamora	30069	153.6	17.0	537.6	1,569.2	161.0	144.8	303.6
Veracruz	Hidalgotitlán	30070	90.9	8.1	594.4	2,189.0	306.3	250.2	370.5
Veracruz	Huatusco	30071	187.3	32.9	1,106.0	3,420.7	366.6	331.4	4,288.4
Veracruz	Huayacocota	30072	91.7	7.6	515.2	1,884.9	248.0	198.7	700.4
Veracruz	Hueyapan de Ocampo	30073	443.4	1,361.0	1,691.8	5,008.2	1,227.9	761.7	364.3
Veracruz	Huiloapan de Cuahtémoc	30074	43.2	2.7	106.4	364.4	18.5	17.3	275.6
Veracruz	Ignacio de la Llave	30075	96.3	7.0	370.3	1,169.5	132.7	113.5	1,187.8
Veracruz	Illamatlán	30076	60.8	4.3	429.1	1,615.5	214.4	182.6	22.1
Veracruz	Isla	30077	309.7	27.3	800.5	2,378.0	279.8	228.9	1,215.8
Veracruz	Ixcatepec	30078	61.9	5.5	456.4	1,732.1	229.2	197.6	180.8
Veracruz	Ixhuacán de los Reyes	30079	41.2	3.0	258.6	963.4	107.8	98.7	904.9
Veracruz	Ixhuatlán del Café	30080	87.0	7.6	541.6	1,944.2	220.6	203.7	388.1
Veracruz	Ixhuatlancillo	30081	63.0	5.3	244.6	851.9	65.0	59.4	121.5
Veracruz	Ixhuatlán del Sureste	30082	79.8	119.9	275.7	663.3	100.1	68.0	943.4
Veracruz	Ixhuatlán de Madero	30083	254.2	19.1	1,819.3	7,000.6	922.2	802.6	111.7
Veracruz	Ixmatalhuacan	30084	46.2	1.8	160.9	847.9	112.8	75.4	293.9
Veracruz	Ixtaczoquitlán	30085	2,073.1	5,010.2	2,860.0	5,382.6	39,210.7	26,269.0	240.7
Veracruz	Jalacingo	30086	155.7	12.0	930.4	2,833.9	336.1	283.6	511.6
Veracruz	Xalapa	30087	2,837.2	744.3	7,283.2	26,174.9	479.2	427.6	486.5
Veracruz	Jalcomulco	30088	19.2	2.3	117.3	406.1	50.7	42.8	156.9
Veracruz	Jáltipan	30089	197.9	26.4	718.2	2,091.4	259.2	209.6	126.5
Veracruz	Jamapa	30090	49.3	3.6	214.8	705.3	77.8	69.0	511.1

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Veracruz	Jesús Carranza	30091	197.7	12.9	713.5	2,458.8	314.9	266.7	291.8
Veracruz	Xico	30092	115.8	13.4	586.4	1,938.8	193.8	181.0	3,053.2
Veracruz	Jilotepec	30093	136.9	551.6	310.1	878.3	277.2	154.3	90.9
Veracruz	Juan Rodríguez Clara	30094	606.3	20.5	801.3	2,679.5	338.1	299.6	957.7
Veracruz	Juchique de Ferrer	30095	83.0	7.7	515.2	1,840.8	208.4	192.6	1,343.7
Veracruz	Landero y Coss	30096	5.7	0.8	28.5	94.5	11.3	8.8	213.4
Veracruz	Lerdo de Tejada	30097	429.8	1,348.7	1,218.5	1,710.5	1,223.4	545.8	84.3
Veracruz	Magdalena	30098	10.2	0.8	63.9	243.7	27.9	25.3	156.4
Veracruz	Maltrata	30099	117.0	6.9	289.5	957.0	103.0	86.6	48.0
Veracruz	Manlio Fabio Altamirano	30100	218.6	7.4	415.2	1,302.0	174.1	129.9	164.8
Veracruz	Mariano Escobedo	30101	120.0	9.7	567.8	2,137.2	215.6	171.8	622.7
Veracruz	Martínez de la Torre	30102	1,049.6	1,365.0	2,434.8	6,387.8	911.3	686.7	790.6
Veracruz	Mecatlán	30103	50.5	4.0	377.7	1,470.0	174.2	164.3	835.2
Veracruz	Mecayapan	30104	90.5	6.5	514.7	1,938.0	261.1	221.8	129.3
Veracruz	Medellín	30105	3,973.5	20.8	1,060.9	3,078.6	518.3	501.9	706.0
Veracruz	Miahuatlán	30106	15.6	1.9	91.5	298.7	35.1	29.2	593.8
Veracruz	Las Minas	30107	11.1	0.8	66.9	252.8	30.8	26.3	60.7
Veracruz	Minatitlán	30108	4,611.4	52,762.0	8,203.5	12,230.7	2,606.0	2,205.8	254.2
Veracruz	Misantla	30109	264.2	30.6	1,401.0	4,471.5	481.6	429.5	5,871.9
Veracruz	Mixtla de Altamirano	30110	37.2	2.7	241.1	923.3	110.7	97.8	607.2
Veracruz	Moloacán	30111	106.0	8.0	358.5	1,208.1	132.4	117.9	41.5
Veracruz	Naolinco	30112	72.3	12.1	369.8	1,167.9	112.3	96.6	373.9
Veracruz	Naranjal	30113	18.6	1.7	131.3	480.1	55.4	51.9	254.0
Veracruz	Nautla	30114	72.5	4.4	273.6	837.2	94.8	84.6	188.4
Veracruz	Nogales	30115	208.1	18.7	526.8	1,915.7	111.6	93.9	52.9
Veracruz	Oluta	30116	77.9	7.0	300.4	862.9	87.2	80.2	387.2
Veracruz	Omealca	30117	187.9	10.1	788.6	3,685.8	475.6	370.7	1,021.8
Veracruz	Orizaba	30118	1,086.4	492.9	2,316.3	7,178.5	246.0	174.4	227.5
Veracruz	Otatitlán	30119	68.6	2.9	304.4	366.8	42.3	30.9	233.0
Veracruz	Oteapan	30120	46.7	5.2	233.5	712.5	69.4	63.3	154.4
Veracruz	Ozuluama	30121	237.9	10.2	578.6	2,051.5	253.4	212.0	77.2
Veracruz	Pajapan	30122	70.6	5.5	442.1	1,538.0	193.1	168.6	82.5
Veracruz	Pánuco	30123	1,111.8	1,059.8	2,100.6	7,638.8	1,676.3	983.2	348.8
Veracruz	Papantla	30124	1,127.1	91.0	4,580.0	15,771.0	1,924.6	1,695.3	3,642.7
Veracruz	Paso del Macho	30125	304.2	326.2	1,130.7	3,452.4	826.6	483.8	477.5
Veracruz	Paso de Ovejas	30126	203.1	12.6	699.4	2,439.6	309.9	237.0	3,208.4
Veracruz	La Perla	30127	77.0	5.9	442.3	1,581.7	171.4	155.6	2,517.1
Veracruz	Perote	30128	323.5	116.9	1,007.8	2,536.0	323.2	214.6	440.1

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Veracruz	Platón Sánchez	30129	102.1	9.1	574.7	1,839.8	250.3	205.3	165.5
Veracruz	Playa Vicente	30130	289.7	26.4	1,468.6	5,285.7	717.5	593.0	209.8
Veracruz	Poza Rica de Hidalgo	30131	1,487.1	3,080.4	3,445.6	7,656.5	1,512.4	1,464.7	719.4
Veracruz	Las Vigas de Ramírez	30132	127.5	7.0	599.2	1,129.5	123.0	109.3	597.9
Veracruz	Pueblo Viejo	30133	257.4	21.6	695.4	1,596.2	112.2	93.0	4,730.8
Veracruz	Puente Nacional	30134	180.9	7.9	421.7	1,407.6	180.8	139.6	112.1
Veracruz	Rafael Delgado	30135	89.6	8.3	352.1	1,354.7	113.8	105.8	287.3
Veracruz	Rafael Lucio	30136	37.9	1.7	75.8	227.8	21.8	15.7	242.4
Veracruz	Los Reyes	30137	18.4	1.3	117.8	445.8	52.4	46.7	23.1
Veracruz	Río Blanco	30138	300.8	54.3	733.7	2,434.0	54.7	48.5	86.7
Veracruz	Saltabarranca	30139	25.8	1.9	107.2	439.5	49.2	34.5	28.5
Veracruz	San Andrés Tenejapan	30140	9.5	0.8	58.3	203.9	23.9	21.3	87.2
Veracruz	San Andrés Tuxtla	30141	654.9	83.8	4,034.3	13,347.3	1,648.5	1,423.6	666.0
Veracruz	San Juan Evangelista	30142	285.1	14.5	900.2	3,096.2	407.7	347.2	111.0
Veracruz	Santiago Tuxtla	30143	261.1	23.9	1,594.5	5,720.7	711.3	612.9	1,681.0
Veracruz	Sayula de Alemán	30144	235.5	14.0	692.1	2,332.3	294.4	251.3	2,703.2
Veracruz	Soconusco	30145	58.8	5.5	288.7	991.6	119.3	103.6	1,217.0
Veracruz	Sochiapa	30146	14.5	1.2	107.7	430.9	50.6	46.3	1,324.3
Veracruz	Soledad Atzompa	30147	74.3	5.4	476.1	1,748.0	197.6	181.5	38.2
Veracruz	Soledad de Doblado	30148	166.4	14.6	717.4	2,278.2	290.5	238.5	542.5
Veracruz	Soteapan	30149	143.2	11.1	1,007.5	3,783.5	569.2	448.6	121.8
Veracruz	Tamalín	30150	52.4	4.6	316.0	1,053.1	118.0	108.7	553.1
Veracruz	Tamiahua	30151	144.7	10.5	700.1	2,390.3	289.6	253.2	292.7
Veracruz	Tampico Alto	30152	134.5	4.7	266.7	861.7	110.0	88.0	577.7
Veracruz	Tancoco	30153	32.2	2.2	189.6	697.8	84.3	76.1	1,266.8
Veracruz	Tantima	30154	96.5	5.0	444.8	1,664.6	211.1	188.0	1,234.7
Veracruz	Tantoyuca	30155	442.2	45.3	2,931.1	10,635.9	1,312.7	1,166.7	345.6
Veracruz	Tatativa	30156	21.0	1.5	128.4	481.8	56.6	49.7	452.5
Veracruz	Castillo de Teayo	30157	134.2	8.0	673.2	2,459.5	329.0	281.6	1,434.6
Veracruz	Tecolutla	30158	186.0	15.7	580.6	1,817.0	210.3	183.4	358.7
Veracruz	Tehuipango	30159	76.9	6.5	482.7	1,857.4	216.5	193.7	96.3
Veracruz	Temapache	30160	1,569.0	74.5	3,292.2	11,497.4	1,472.6	1,336.4	1,377.0
Veracruz	Tempoal	30161	189.3	18.7	1,031.6	3,724.6	468.4	393.0	83.4
Veracruz	Tenampa	30162	27.3	2.4	189.0	702.3	82.9	76.7	1,829.1
Veracruz	Tenochtitlán	30163	23.9	1.9	142.1	508.4	56.5	52.3	3,018.5
Veracruz	Teocelo	30164	59.8	6.3	303.5	993.1	98.5	91.9	70.7
Veracruz	Tepatlaxco	30165	35.8	2.6	242.4	913.6	107.1	99.1	129.3
Veracruz	Tepetlán	30166	35.3	2.5	205.5	763.4	88.7	76.3	149.4

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Veracruz	Tepetzintla	30167	65.7	5.9	430.7	1,588.2	187.2	172.7	68.3
Veracruz	Tequila	30168	52.8	4.3	341.2	1,277.4	153.4	134.6	116.9
Veracruz	José Azueta	30169	319.8	11.7	621.5	2,336.3	319.7	245.0	947.0
Veracruz	Texcatepec	30170	41.9	3.3	300.5	1,143.1	160.3	128.9	27.1
Veracruz	Texhuacán	30171	20.3	1.7	128.7	485.6	60.4	51.4	181.2
Veracruz	Texistepec	30172	122.7	8.0	544.5	1,937.0	287.4	220.2	132.5
Veracruz	Tezonapa	30173	717.7	3,070.0	2,299.4	8,104.5	2,228.4	1,355.7	1,057.9
Veracruz	Tierra Blanca	30174	694.2	55.2	1,954.1	5,041.9	613.4	444.9	443.2
Veracruz	Tihuatlán	30175	1,481.9	8,389.8	2,166.7	7,112.5	1,296.0	1,042.5	2,707.3
Veracruz	Tlacojalpan	30176	44.3	2.5	128.6	570.5	74.0	53.4	1,849.8
Veracruz	Tlacolulan	30177	37.9	2.7	226.3	852.0	99.4	87.2	555.4
Veracruz	Tlacotalpan	30178	77.5	10.2	257.6	731.4	74.0	52.7	112.0
Veracruz	Tlacotepec de Mejía	30179	16.5	2.0	129.3	533.5	67.3	55.3	96.3
Veracruz	Tlachichilco	30180	52.1	3.9	378.3	1,412.9	195.2	161.8	982.9
Veracruz	Tlalixcoyan	30181	331.8	19.8	671.0	1,827.1	217.7	169.1	348.4
Veracruz	Tlalnelhuayocan	30182	45.9	4.5	231.9	823.8	83.1	75.4	1,722.8
Veracruz	Tlapacoyan	30183	196.6	28.7	862.8	2,291.0	187.3	176.3	204.2
Veracruz	Tlaquilpan	30184	27.3	2.1	173.4	661.6	79.6	69.6	91.3
Veracruz	Tlilapan	30185	16.5	1.5	92.2	321.1	33.4	31.7	164.1
Veracruz	Tomatlán	30186	23.2	2.2	121.7	482.3	54.8	41.2	60.9
Veracruz	Tonayán	30187	20.8	1.5	127.6	483.4	56.7	50.0	16.9
Veracruz	Totutla	30188	68.1	5.2	486.0	1,929.8	229.3	204.4	207.3
Veracruz	Túxpam	30189	25,961.0	227,969.9	2,285.7	7,592.0	13,270.4	8,778.6	199.7
Veracruz	Tuxtilla	30190	27.5	1.4	59.0	259.6	33.3	25.2	87.4
Veracruz	Ursulo Galván	30191	706.4	537.5	1,175.5	2,357.9	2,007.5	828.6	544.9
Veracruz	Vega de Alatorre	30192	105.0	10.2	329.5	975.1	92.3	83.0	2,044.6
Veracruz	Veracruz	30193	19,352.4	1,084.4	9,762.7	27,330.4	1,045.3	930.3	638.7
Veracruz	Villa Aldama	30194	47.6	2.5	175.4	593.6	66.9	56.5	149.5
Veracruz	Xoxocotla	30195	19.1	1.6	134.6	448.4	59.4	48.1	436.1
Veracruz	Yanga	30196	71.7	8.8	359.7	1,439.0	164.5	123.5	783.9
Veracruz	Yecuatla	30197	51.7	4.1	284.0	979.0	105.4	96.9	421.3
Veracruz	Zacualpan	30198	30.6	2.4	195.5	716.9	100.5	78.0	128.1
Veracruz	Zaragoza	30199	41.1	3.8	279.8	1,045.7	123.4	113.8	96.1
Veracruz	Zentla	30200	56.8	4.1	433.8	1,849.7	234.6	191.9	221.7
Veracruz	Zongolica	30201	184.8	16.2	1,327.8	4,795.5	610.4	534.2	383.7
Veracruz	Zontecomatlán	30202	59.7	4.6	449.4	1,716.8	244.0	200.0	49.9
Veracruz	Zozocolco de Hidalgo	30203	52.5	4.0	288.9	1,034.4	111.6	103.5	84.7
Veracruz	Agua Dulce	30204	170.8	31.1	673.4	1,686.3	138.4	121.1	172.6

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State Name	Municipality Name	State/ Municipality Code	NO _x	SO _x	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
Veracruz	El Higo	30205	484.0	617.5	868.2	2,470.4	1,431.7	643.7	418.4
Veracruz	Nanchital de Lázaro Cárdenas del Río	30206	117.1	19.5	344.0	693.6	35.2	29.3	381.2
Veracruz	Tres Valles	30207	1,706.9	6,830.7	2,000.6	4,007.2	3,036.6	1,387.2	429.7
Veracruz	Carlos A. Carrillo	30208	804.2	6,191.9	1,045.3	2,421.3	2,178.1	1,000.6	90.9
Veracruz	Tatahuicapan de Juárez	30209	43.1	3.1	130.4	282.8	89.3	24.9	209.1
Veracruz	Uxpanapa	30210	80.5	4.2	212.0	531.2	14.0	12.7	166.9
Veracruz Total			110,519.8	342,391.8	209,047.8	547,963.6	129,870.5	93,645.6	124,392.6
Yucatán	Abalá	31001	30.4	2.1	175.7	629.0	77.1	69.6	362.9
Yucatán	Acanceh	31002	142.1	8.1	386.3	1,327.2	153.3	142.1	522.2
Yucatán	Akil	31003	89.3	5.9	305.6	1,069.1	126.1	116.9	104.3
Yucatán	Baca	31004	30.9	2.3	125.0	423.7	45.3	42.9	186.8
Yucatán	Bokobá	31005	24.0	1.0	53.0	188.0	22.8	20.2	151.8
Yucatán	Buctzotz	31006	47.7	5.2	265.9	779.8	96.9	84.5	890.3
Yucatán	Cacalchén	31007	66.2	3.7	172.3	627.0	72.3	67.1	249.1
Yucatán	Calotmul	31008	60.6	2.2	146.1	459.9	79.9	56.4	275.0
Yucatán	Cansahcab	31009	32.0	2.5	135.4	457.4	54.8	48.9	100.3
Yucatán	Cantamayec	31010	18.3	0.9	79.6	262.5	40.8	31.2	130.1
Yucatán	Celestún	31011	53.5	5.9	138.5	408.3	40.2	38.5	175.9
Yucatán	Cenotillo	31012	20.4	1.7	129.6	329.5	50.1	37.6	339.8
Yucatán	Conkal	31013	55.2	3.4	147.7	462.8	44.3	42.1	228.1
Yucatán	Cuncunul	31014	8.1	0.5	43.2	153.4	25.9	18.6	90.0
Yucatán	Cuzamá	31015	32.4	1.9	141.4	528.7	62.6	58.7	131.2
Yucatán	Chacsinkín	31016	25.8	2.7	95.0	302.2	51.4	36.9	86.5
Yucatán	Chankom	31017	22.7	1.5	141.1	504.7	87.4	62.1	200.1
Yucatán	Chapab	31018	42.3	1.7	94.4	336.6	48.4	39.1	117.8
Yucatán	Chemax	31019	151.8	11.7	929.2	3,490.5	472.7	403.8	631.4
Yucatán	Chicxulub Pueblo	31020	21.6	1.8	89.9	316.9	34.5	32.8	71.1
Yucatán	Chichimilá	31021	38.5	2.8	211.7	796.5	115.1	92.5	178.7
Yucatán	Chikindzonot	31022	20.4	1.6	122.7	443.7	79.9	55.3	174.6
Yucatán	Chocholá	31023	56.5	2.3	97.1	307.9	36.0	31.5	221.4
Yucatán	Chumayel	31024	37.8	2.0	115.0	343.4	47.8	39.2	93.4
Yucatán	Dzan	31025	29.7	2.7	139.8	490.7	63.1	54.8	81.4
Yucatán	Dzemul	31026	20.3	1.5	79.8	267.9	29.2	27.4	137.9
Yucatán	Dzidzantún	31027	43.0	5.3	169.2	536.3	56.0	51.6	206.7
Yucatán	Dzilam de Bravo	31028	80.3	1.8	436.3	2,347.4	275.7	242.1	254.1
Yucatán	Dzilam González	31029	36.2	3.5	186.8	568.0	74.9	62.4	460.6
Yucatán	Dzitás	31030	67.6	2.0	114.9	409.6	56.4	47.2	123.4

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Yucatán	Dzoncauich	31031	36.6	1.6	88.9	303.8	43.0	34.9	128.8
Yucatán	Espita	31032	140.0	6.6	438.6	1,506.2	201.2	171.3	363.3
Yucatán	Halachó	31033	149.1	9.1	564.1	1,930.0	241.8	214.4	530.0
Yucatán	Hocabá	31034	53.1	2.9	169.5	624.9	74.3	68.9	139.3
Yucatán	Hoctún	31035	32.5	2.6	149.0	514.6	60.9	54.7	265.2
Yucatán	Homún	31036	48.0	3.1	196.5	683.5	82.0	74.8	152.5
Yucatán	Huhí	31037	68.3	2.7	129.4	449.5	56.5	49.7	97.5
Yucatán	Hunucmá	31038	158.5	15.3	621.9	2,071.8	218.3	207.3	1,109.8
Yucatán	Ixil	31039	36.2	1.7	101.5	301.3	32.8	31.2	74.0
Yucatán	Izamal	31040	227.6	14.3	648.3	2,119.1	244.1	223.0	296.4
Yucatán	Kanasín	31041	412.3	24.4	922.0	3,606.6	221.1	210.7	320.8
Yucatán	Kantunil	31042	29.2	2.0	149.5	548.3	69.2	60.4	163.6
Yucatán	Kaua	31043	13.6	1.2	73.8	270.4	39.5	31.5	62.1
Yucatán	Kinchil	31044	32.4	3.2	168.8	605.3	76.4	66.9	296.8
Yucatán	Kopomá	31045	44.6	1.4	73.7	260.9	33.1	29.5	197.7
Yucatán	Mama	31046	31.1	1.6	105.1	329.6	46.6	37.9	82.0
Yucatán	Maní	31047	47.5	2.9	165.7	534.4	74.5	60.9	83.1
Yucatán	Maxcanú	31048	147.7	10.8	566.0	2,011.1	248.9	221.2	571.3
Yucatán	Mayapán	31049	38.8	1.3	108.8	314.6	49.3	37.4	57.2
Yucatán	Mérida	31050	9,136.3	9,538.0	15,593.4	47,084.6	2,774.8	2,432.8	1,825.3
Yucatán	Mocochá	31051	16.2	1.0	59.7	194.6	20.4	19.0	92.9
Yucatán	Motul	31052	323.6	20.5	875.7	2,505.4	273.3	255.1	522.9
Yucatán	Muna	31053	93.5	7.6	384.4	1,485.6	183.5	159.0	198.6
Yucatán	Muxupip	31054	18.0	1.3	82.8	292.8	34.3	32.0	94.0
Yucatán	Opichén	31055	34.9	2.5	179.9	640.7	96.3	75.4	451.4
Yucatán	Oxkutzcab	31056	167.2	19.2	692.1	2,366.3	288.5	253.0	291.8
Yucatán	Panabá	31057	46.2	4.4	286.3	761.3	89.1	81.2	1,350.5
Yucatán	Peto	31058	127.5	12.9	630.9	2,205.4	294.9	245.6	421.1
Yucatán	Progreso	31059	1,465.3	63.5	1,899.7	3,249.7	133.6	126.6	479.5
Yucatán	Quintana Roo	31060	25.6	0.7	36.3	122.7	18.9	14.7	43.6
Yucatán	Río lagartos	31061	26.1	1.9	77.7	150.3	14.3	12.5	331.7
Yucatán	Sacalum	31062	22.4	2.3	118.2	422.6	58.1	47.7	84.3
Yucatán	Samahil	31063	24.9	1.8	135.4	500.6	59.4	54.9	456.3
Yucatán	Sanahcat	31064	24.5	0.8	45.7	168.9	20.6	18.8	46.6
Yucatán	San Felipe	31065	12.0	1.4	75.4	175.3	19.8	16.9	765.8
Yucatán	Santa elena	31066	30.9	4.3	118.2	428.7	56.3	49.1	141.7
Yucatán	Seyé	31067	86.1	4.1	231.1	817.3	94.8	87.4	117.9
Yucatán	Sinanché	31068	26.6	1.8	77.8	260.8	29.8	27.3	79.9

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Yucatán	Sotuta	31069	66.9	4.4	245.4	881.0	124.3	101.1	234.7
Yucatán	Sucilá	31070	24.1	2.5	141.0	386.3	48.3	42.0	938.1
Yucatán	Sudzal	31071	9.0	0.6	51.9	181.0	25.0	20.7	225.5
Yucatán	Suma	31072	19.9	1.1	63.9	190.5	22.8	20.5	64.5
Yucatán	Tahdziú	31073	25.1	1.5	115.9	408.8	63.8	48.8	91.5
Yucatán	Tahmek	31074	22.9	1.9	100.9	339.9	39.6	36.2	259.7
Yucatán	Teabo	31075	45.7	2.9	172.0	576.6	75.1	64.8	141.6
Yucatán	Tecoh	31076	157.8	7.2	441.7	1,581.4	189.0	173.0	259.0
Yucatán	Tekal de Venegas	31077	42.8	1.4	72.7	268.2	34.1	30.2	225.1
Yucatán	Tekantó	31078	59.9	2.5	122.1	396.2	46.6	42.7	286.9
Yucatán	Tekax	31079	408.4	23.1	1,123.4	3,834.7	537.5	441.9	975.0
Yucatán	Tekit	31080	109.7	5.3	314.4	938.9	112.3	102.1	152.4
Yucatán	Tekom	31081	16.6	1.3	91.3	325.4	50.8	38.7	136.7
Yucatán	Telchac Pueblo	31082	32.8	2.0	90.3	264.6	28.5	26.6	69.1
Yucatán	Telchac Puerto	31083	9.7	1.2	33.0	93.7	9.0	8.5	15.8
Yucatán	Temax	31084	51.6	3.6	204.3	676.1	86.4	74.6	205.8
Yucatán	Temozón	31085	78.4	5.4	444.7	1,475.8	212.2	171.0	425.4
Yucatán	Tepakán	31086	14.8	1.0	67.4	235.0	28.6	25.8	267.9
Yucatán	Tetiz	31087	25.5	2.0	125.5	461.8	53.5	50.0	551.6
Yucatán	Teya	31088	11.0	0.9	57.6	213.0	26.0	23.4	156.5
Yucatán	Ticul	31089	330.4	27.6	891.6	2,685.4	304.8	277.0	278.0
Yucatán	Timucuy	31090	34.5	2.4	185.5	692.2	81.5	76.0	120.4
Yucatán	Tinúm	31091	91.4	12.4	286.9	982.8	140.1	111.5	195.0
Yucatán	Tixcacalcupul	31092	30.5	2.1	174.9	650.5	100.6	77.2	180.2
Yucatán	Tixkokob	31093	109.2	8.0	321.2	1,075.6	109.6	104.0	231.7
Yucatán	Tixméhuac	31094	25.3	1.7	136.6	497.8	73.8	58.4	104.6
Yucatán	Tixpéhual	31095	49.1	2.0	119.7	416.0	46.1	42.9	79.2
Yucatán	Tizimín	31096	416.9	43.4	2,070.6	6,325.6	854.2	692.9	5,946.3
Yucatán	Tunkás	31097	84.5	2.2	121.2	386.6	56.1	44.8	239.6
Yucatán	Tzucacab	31098	102.1	7.2	412.3	1,461.2	200.3	167.5	371.1
Yucatán	Uayma	31099	37.4	1.5	102.0	365.0	60.2	44.2	113.1
Yucatán	Ucú	31100	17.9	1.3	78.6	284.0	31.5	29.9	621.1
Yucatán	Umán	31101	532.1	168.0	1,783.7	3,887.0	294.6	276.6	936.9
Yucatán	Valladolid	31102	2,328.5	19,575.9	1,453.2	4,783.5	1,468.0	1,139.7	615.9
Yucatán	Xocchel	31103	16.6	1.7	85.3	316.4	40.6	35.2	214.8
Yucatán	Yaxcabá	31104	75.1	5.1	436.7	1,611.3	233.0	187.3	528.6
Yucatán	Yaxkukul	31105	15.5	1.3	60.8	207.9	23.2	21.5	44.2
Yucatán	Yobaín	31106	12.0	1.0	57.3	190.9	23.0	20.3	105.3

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Yucatán Total			20,402.2	29,827.9	45,367.2	142,937.0	15,150.5	12,999.6	36,372.4
Zacatecas	Apozol	32001	36.7	5.5	159.8	470.8	58.6	41.6	180.2
Zacatecas	Apulco	32002	21.6	2.5	98.3	276.8	45.5	25.8	196.8
Zacatecas	Atolinga	32003	13.6	3.0	69.1	175.0	29.4	16.1	506.5
Zacatecas	Benito Juárez	32004	22.7	8.2	99.4	268.9	33.2	23.8	416.2
Zacatecas	Calera	32005	267.3	325.2	845.7	1,045.4	185.4	68.9	731.2
Zacatecas	Cañitas de Felipe Pescador	32006	348.0	12.3	182.7	465.7	181.2	79.5	221.7
Zacatecas	Concepción del Oro	32007	139.9	78.2	258.9	551.2	71.0	43.4	681.1
Zacatecas	Cuauhtémoc	32008	114.5	12.1	174.7	469.3	76.8	38.7	188.7
Zacatecas	Chalchihuites	32009	91.7	9.1	251.7	706.8	174.2	75.8	800.5
Zacatecas	Fresnillo	32010	2,022.2	647.7	3,336.2	6,813.7	1,819.0	767.0	3,309.3
Zacatecas	Trinidad García de la Cadena	32011	27.0	4.9	141.4	591.4	71.2	57.1	323.2
Zacatecas	Genaro Codina	32012	92.3	3.6	141.1	404.7	89.2	41.8	117.8
Zacatecas	General Enrique Estrada	32013	51.2	10.2	93.6	171.7	100.4	25.9	309.9
Zacatecas	General Francisco R. Murguía	32014	750.9	19.2	501.7	1,256.2	563.2	226.0	1,466.9
Zacatecas	El Plateado de Joaquín Amaro	32015	14.9	2.6	46.3	119.4	26.9	13.4	126.7
Zacatecas	General Pánfilo Natera	32016	183.6	18.7	361.0	895.1	235.8	92.0	356.2
Zacatecas	Guadalupe	32017	1,312.0	379.7	2,185.0	6,215.9	512.4	246.4	1,226.1
Zacatecas	Huanusco	32018	29.6	3.1	118.2	335.3	52.5	32.9	227.6
Zacatecas	Jalpa	32019	111.0	35.3	521.0	1,425.2	161.9	121.4	420.8
Zacatecas	Jerez	32020	423.2	159.0	1,008.5	1,971.9	269.0	133.3	622.8
Zacatecas	Jiménez del Teul	32021	26.3	3.2	139.2	478.4	61.4	46.9	621.6
Zacatecas	Juan Aldama	32022	347.2	30.5	372.3	794.3	422.6	139.9	845.9
Zacatecas	Juchipila	32023	55.8	21.4	233.9	501.5	51.3	34.7	376.4
Zacatecas	Loreto	32024	263.0	72.6	608.1	1,413.7	174.3	83.0	347.3
Zacatecas	Luis Moya	32025	139.3	92.9	229.2	420.3	77.5	35.6	265.3
Zacatecas	Mazapil	32026	236.6	45.3	454.8	1,311.1	251.0	143.6	1,464.7
Zacatecas	Melchor Ocampo	32027	11.5	0.9	66.2	205.2	26.2	19.1	212.7
Zacatecas	Mezquital del Oro	32028	17.3	2.0	83.8	249.6	25.3	24.2	233.0
Zacatecas	Miguel Auza	32029	262.4	35.3	386.3	794.2	462.7	137.4	1,017.0
Zacatecas	Momax	32030	22.6	3.9	117.3	489.4	57.4	46.6	371.9
Zacatecas	Monte Escobedo	32031	86.5	11.3	438.2	1,920.2	246.2	188.8	362.9
Zacatecas	Morelos	32032	467.4	39.0	235.4	566.8	171.2	94.1	307.9
Zacatecas	Moyahua de Estrada	32033	29.3	3.8	155.4	504.4	69.7	49.5	407.9
Zacatecas	Nochistlán de Mejía	32034	124.7	45.7	551.2	1,344.7	170.9	102.3	694.8
Zacatecas	Noria de Angeles	32035	149.6	42.7	230.2	598.4	136.3	58.7	209.5
Zacatecas	Ojocaliente	32036	405.5	84.1	656.0	1,556.6	313.9	141.9	570.2
Zacatecas	Pánuco	32037	596.2	17.5	320.5	848.0	307.7	150.1	413.3

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Zacatecas	Pinos	32038	928.3	40.0	1,352.0	3,922.2	1,034.1	487.0	1,443.8
Zacatecas	Río Grande	32039	745.3	85.9	1,020.0	2,137.0	811.7	269.2	1,626.5
Zacatecas	Saín Alto	32040	457.8	15.2	418.8	1,167.4	392.6	167.9	953.6
Zacatecas	El Salvador	32041	80.3	2.0	74.1	217.9	35.7	22.1	218.3
Zacatecas	Sombrerete	32042	2,300.4	198.5	1,371.7	3,267.7	1,939.7	771.4	3,391.8
Zacatecas	Susticacán	32043	5.5	1.2	24.6	67.3	6.8	4.8	77.4
Zacatecas	Tabasco	32044	80.7	50.5	342.2	877.8	91.9	71.3	343.6
Zacatecas	Tepechitlán	32045	48.9	10.6	220.8	676.7	85.1	61.2	703.4
Zacatecas	Tepetongo	32046	58.1	4.8	166.4	429.7	94.5	43.5	291.0
Zacatecas	Teul de González Ortega	32047	71.6	6.6	378.1	1,640.9	192.2	158.7	719.4
Zacatecas	Tlaltenango de Sánchez Román	32048	103.2	46.1	477.0	1,197.9	124.2	90.9	539.8
Zacatecas	Valparaíso	32049	282.8	45.6	820.3	2,335.5	389.8	227.8	2,173.3
Zacatecas	Vetagrande	32050	262.0	22.9	146.7	391.8	166.1	82.2	214.0
Zacatecas	Villa de Cos	32051	867.2	38.9	735.1	1,772.5	897.5	332.6	2,946.3
Zacatecas	Villa García	32052	84.1	28.9	250.8	620.1	125.9	54.5	179.0
Zacatecas	Villa González Ortega	32053	57.7	19.0	195.7	432.7	116.8	39.5	106.5
Zacatecas	Villa Hidalgo	32054	117.7	9.4	272.9	730.0	134.5	64.6	227.7
Zacatecas	Villanueva	32055	265.6	54.4	597.6	1,440.8	287.5	133.2	619.1
Zacatecas	Zacatecas	32056	992.2	520.4	3,079.5	7,317.6	225.0	131.5	695.1
Zacatecas	Trancoso	32057	47.1	1.8	141.5	385.0	8.2	6.7	14.8
Zacatecas Total			17,171.7	3,494.9	27,957.8	69,655.5	14,942.4	6,887.4	38,636.6
Mexico Total			1,424,628	2,856,516	2,599,654	7,493,909	794,349	574,387	1,305,442